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ABSTRACT

Participants of a conference dealing with problems of maternal and neonatal narcotic addiction discussed issues regarding treatment of pregnant addicts and their children and considered steps that could be taken to address the issues. The subject areas covered were followup evaluation, treatment procedures and models, development of standardized instruments for measurement of neonates, child development, parent training, and training and technical assistance needs. Research papers included in the proceedings are: An Overview of the Hutzel Hospital Program; Some Measures of Parenting Behavior for Addicted and Nonaddicted Mothers; Quality of Prenatal Treatment of Narcotic Addicted Women as a Factor in Neonatal Outcome; Management of Drug Dependent Pregnancy and Effects on Neonatal Outcome; Role of Qualitative and Quantitative Analysis of Drugs and Their Metabolites in Maternal-Neonatal Studies; Management of Pediatric Medical Problems in the Addicted Household; Developmental Findings with Infants Born to Mothers on Methadone Maintenance; Neonatal Narcotic Withdrawal Index: A Quantitative Method for Evaluation of Narcotic Abstinence on the Newborn; Developmental Assessment of All Infants Born to the Family Care Program, 1975-1976; Team Practice with Pregnant Addicts and Addicted Mothers; Monitoring and Evaluating Comprehensive Care of Addicted Families; and Investigating Treatment Outcomes: A Who Done It Model. (JI)

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National Institute on Drug Abuse

Symposium on Comprehensive Health Care for ADDICTED FAMILIES AND THEIR CHILDREN

May 20 & 21, 1976, New York, New York

SERVICES RESEARCH REPORT

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National Institute on Drug Abuse

Symposium on Comprehensive Health Care for ADDICTED FAMILIES AND THEIR CHILDREN

May 20 & 21, 1976, New York, New York

SERVICES RESEARCH REPORT

Services Research Branch
Division of Resource Development
National Institute on Drug Abuse
and
Center for Comprehensive Health Practice
New York Medical College

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FOREWORD

I was pleased that NIDA was able to play a role in helping to plan this important conference dealing with the complex problem of maternal and neonatal narcotic addiction. Although there is now a greater recognition of this problem in the United States, there is still much to be learned about the clinical management of the addicted mother and her child. We do not, as yet, have sufficient data on the long-term effects of maternal drug use, drug dependency, and withdrawal on the developing infant and child.

It was particularly gratifying to find that this conference involved professionals who are actively engaged in administering treatment programs for pregnant drug dependent women and their children and evaluating the results. By sharing information and reaching some consensus on the state-of-the-art and the issues that need to be addressed, we are in a better position to move ahead in our work. Hopefully, there will be less duplication and a better utilization of scarce resources.

Although the material contained in these proceedings does not necessarily reflect the position of NIDA, it does represent the experiences and viewpoints of people who are intimately associated with the subject area.

Robert L. DuPont, M.D.
Director
National Institute on Drug Abuse

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1. INTRODUCTION

Despite the recent overall reduction in the birth rate in the United States, many hospitals have reported sharp increases in the number of births in one such group: drug-addicted mothers (1,2). The adverse effects of narcotic drugs on these women and their newborn have been well documented. Greater incidence of maternal and fetal complications associated with heroin use has been reported in a number of studies. Children born to addicted mothers experience more physiological problems and higher mortality rates than children born to nonaddicted women from the same socioeconomic class (3,4,5,6).

In attempting to deal with this drug abuse problem, institutions located in different parts of the country have organized and implemented studies and demonstration projects to test and evaluate the use of methadone as a tool in helping to manage the addicted woman during pregnancy and to lessen the risk of heroin use to her child.

The application of methadone therapy in the management of the pregnant addict is a relatively new procedure, having first been introduced under study conditions in the late 60's. This type of therapy involves another addicting drug. It thus requires ongoing clinical supervision and tight management of the drug. The need for systematic examination of a number of questions also arises. There is a clear need to determine the appropriate dosage level, and to discover the effects of the drug on the woman, the fetus, and the newborn. In addition, it is necessary to periodically reassess the treatment protocol, and utilize instruments that have been developed to facilitate more precise evaluations of the infant's physiological and psychological state after delivery.

Beth Israel Hospital, in New York City, reported the first studies of the outcome of pregnant addicts treated with methadone. They found that maternal medical complications were reduced, but that the incidence of low birth weight remained relatively high (7). Since then, many institutions have been attempting to study and compare the effectiveness of methadone treatment protocols on pregnant addict populations.

The task of comparing the methadone withdrawal syndrome with the heroin withdrawal syndrome has been complicated by the many different variables operating concurrently in clinical settings. Most studies that have been reported were based on clinical experience, without regard to principles of research design such as including appropriate control populations. Different investigators did not use the same parameters for measuring maternal, fetal, and neonatal

changes and often reported different and noncomparable outcomes. In general, methadone babies were more likely to be larger, healthier and at less of a health risk than heroin babies. But there were factors other than drug regimen to be considered in evaluating such outcomes. The methadone mothers were quite different from those who abused heroin. For example, methadone mothers had responded and volunteered to participate in a methadone treatment program, often in the interest of producing a healthy child. By enrolling in a methadone program, they generally received more prenatal care, which is regarded as a significant factor in determining the health of the mother and her child after delivery.

Conflicting findings regarding the neurological and physiological effects of methadone on the neonate have emerged from some recent studies. Our knowledge of the effects of this treatment modality and how it may be optimally implemented is quite limited. Clinicians and researchers have also reached different conclusions about the desirability of maintaining patients on either low, medium, or high doses of methadone (8,9,10,11,12). Advocates of low dose methadone regimes have found that their patients are at less risk, but there are also data to show that a high percentage of patients on low dose regimes supplement their methadone with other drugs (13). The clinical concomitants of polydrug use in methadone treated pregnant patients are generally unknown.

At the present time, th programs engaged in related research and demonstration areas in this field have been operating in isolation. Their findings are only shared periodically, mainly in professional journals and conferences. Since different programs formulate and classify differently and methodologies vary, it is often difficult to compare the data generated by different investigators. In addition, many of these research efforts are struggling with limited resources or involve grants with limited time spans, thereby making it difficult to improve study techniques, expand samples, or conduct studies suggested by preliminary or clinical data and advance knowledge. The compilation and sharing of information are very limited in this field. As a result, we know little about how this addiction problem is being treated in drug programs and hospitals throughout the Nation. There are practically no data available on the number of pregnant addicts who require, seek, or receive treatment in different areas of the country. Accurate statistics have not been produced on the nature and extent of the pregnant addict problem as it confronts us today.

Hospital policies and procedures regarding treatment of neonatal addiction vary. The length of hospital stay is sometimes of such a short duration that mothers leave the hospital with their infants before the onset of withdrawal symptoms in the neonate. Often, physicians are reluctant to record private maternity patients as addicted. This may be done either to protect their patients or from fear of possible legal entanglements. There are also indications that neonatal withdrawal often is undetected because of the lack of experience or familiarity with this problem (2).

In the literature it has been acknowledged that there is a need to establish comprehensive treatment models for the pregnant addict and her newborn. However, we are aware of the fact that few drug treatment programs at this time

have the necessary resources or the capability of providing the comprehensive care required by these patients.

The National Institute on Drug Abuse is currently providing support to programs that are engaged in studying problems associated with the pregnant addict, while at the same time attempting to develop model treatment approaches and methods that can be replicated in the field. These programs are administered by the following agencies and institutions: Philadelphia General Hospital, New York Medical College, Hutzel Hospital (Detroit, Michigan), Baylor Medical College (Houston, Texas), Children's Hospital (Washington, D.C.), and Marin Open House (San Rafael, California).

The symposium "Comprehensive Health Care for Addicted Families and Their Children" was organized as a vehicle to bring together investigators who are working in this specialized treatment area so they could share their findings, experiences, and problems. Another important goal was to develop mechanisms for communicating, planning, and possibly collaborating in areas needing further research development. It was felt that with knowledge of each other's activities, there would be less duplication of effort and more opportunities to work together to enhance studies and produce more comprehensive, coordinated, and reliable research. The symposium was structured to help the participants establish more appropriate methods and means of transmitting newly gained information to those clinicians in the field who are responsible for treating pregnant addicts and their children.

The symposium was organized to include written presentations arranged by common areas of investigation and reporting. Most of the first day was devoted to the presentation of these papers. The conference chairman gave a brief introduction, highlighting the purpose of the meeting, reviewing the agenda, and providing a description of the comprehensive care treatment model implemented at the New York Medical College. On the second day after all of the papers were delivered, conference participants engaged in open discussions regarding the material presented in the papers and related subject areas. The chairman attempted to focus the discussion on specific areas until conclusions were reached, but this was not always possible because of the size of the group and the close relationship between the different subjects discussed.

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2. PROCEEDINGS

Opening Remarks

Dr. Richard Brotman began the symposium by welcoming the participants and describing the purpose of the symposium, which was organized by the New York Medical College staff at the request of the Services Research Branch, Division of Resource Development, National Institute on Drug Abuse.

In outlining the symposium objectives, Dr. Brotman said that the primary goals were to: 1) exchange information on the research activities taking place; 2) review the issues regarding the treatment of the pregnant addict and her offspring; 3) identify gaps in knowledge; 4) consider potential areas of collaboration; and 5) establish communication and planning mechanisms to enhance our research and demonstration efforts. He indicated that one of the themes that would be highlighted throughout the conferences is the concept of comprehensiveness, and that it is generally acknowledged that a coordinated system of services is required to meet the multiple physical, psychological, and social problems experienced by pregnant addicts and their children.

By way of illustration, he referred to the obstetrical and medical complications that are found in this patient population, such as pelvic inflammatory diseases, thrombophlebitis, cellulitis, abscess formation and ulceration, serum hepatitis, and other problems associated with poor nutrition and drug use. Social and emotional problems, feelings of worthlessness and depression also add to the overall difficulty of managing these cases. This, he observed, underscores the other needs of pregnant addicts that should be considered in a service delivery scheme, including family therapy, child care, parenting, vocational and educational services, psychological services, and aftercare. He also pointed to the symptoms of passive addiction and other disorders, deficiencies (prematurity and low birth weight) and illness common to infants born to pregnant addicts.

Dr. Brotman discussed this approach to service to the pregnant addict by describing New York Medical College's Pregnant Addicts-Addicted Mothers Program (PAAM). This program is a component of the Center for Comprehensive Health Practice, an amalgam of five departments: Internal Medicine, Obstetrics-Gynecology, Pediatrics, Psychiatry, and Surgery. The Center has responsibility for providing primary care to the community and for developing a curriculum for the education of medical students. The students in the primary care unit spend time in the PAAM program, providing an important staffing resource for

the program. Residency training, involving all five departments, is also beginning in this training area.

Located within the East Harlem community, which includes some 178,000 people, the PAAM program operates in one of the highest heroin addiction areas in the country. Fifty-two percent of the population is comprised of Spanish-Americans, thirty-eight percent are black, and ten percent are white, with Italian-Americans the largest segment of the white population. East Harlem has the second lowest income population in New York City and the second highest incidence of crime, delinquency, and drug use.

The number of addicted births treated by the hospital has increased steadily since 1959. In 1960, one out of every 164 births involved a drug-addicted mother. By 1974, one in every 29 births was to a drug-addicted mother.

The PAAM program provides comprehensive treatment for pregnant addicts, their husbands, and infants. It includes obstetrical, psychosocial, pediatric care, and family services. The program is studying the influence of this comprehensive care on the morbidity and mortality of the pregnant addict and her infant, as well as methods of managing neonatal narcotic withdrawal, and evaluation of treatment outcome over time.

Dr. Brotman reviewed the concept of "comprehensive care" and the many ways it can be defined. He presented a paradigm for consideration by the participants. The paradigm includes three major areas of activity: 1) service, 2) training, and 3) research. Each of these spans four levels of intervention, from individual, through interactional and organizational, to the institutional. The following chart gives examples of targets in each area at each level.

	LEVEL OF INTERVENTION			
	Individual	Interactional	Organizational	Institutional
Service	Drug user	Drug users relating to family	Housing Dept. policies	Public's image of drug addicts
Training	Medical student	Resident treating drug user	Hospital admitting drug user	Professional image of addict
Research	One subject (via psychological test)	Married pair (via symbolic interactionist study)	Treatment program (via operations research)	Statuses, values, and attitudes (via survey research)

Dr. Brotman showed how the paradigm can be used to make a systematic inventory of the targets for change addressed and to discover those that are not. For example, most drug treatment programs focus on providing service to the drug abuser and affecting his or her family interactions, but few systematically attempt to change exclusionary housing (or employment) policies regarding drug patients. In short, wherever the primary interest or emphasis of a program lies, consideration must also be given to the other cells.

He pointed out that, in particular, the different service goals need to be recognized and specified. Many programs are geared toward special targets of change rather than a comprehensive approach. Some are concerned primarily with the mother while others are involved in the entire process from prenatal to birth and the early neonatal phase. Some programs are concerned only with individuals (mothers, infants, etc.) as targets of change while others are involved with groups of people, e.g., the community and the family. The latter is the principal target of change in the New York Medical College program.

It is recognized that drug-addicted women must relate to many different organizations and institutions in our society--family agencies, social services, welfare, health, etc. Yet data from other drug treatment programs designed to treat female addicts indicate that patients are generally not successful in gaining access to needed services. Often this is because of organizational policies and practices. In a comprehensive program, he stressed, targets of change which are important for clients become more apparent.

Dr. Brotman pointed out that drug treatment programs generally do not have the resources required to treat the pregnant addict and do not take the steps to insure that appropriate services are being delivered. For example, methadone maintenance treatment programs usually end up treating addicts with methadone over long periods of time with only limited counseling and support services. When a woman enrolled in a methadone program becomes pregnant she is sometimes referred to other organizations for certain services (e.g., prenatal care), but often without adequate followup to insure continuity of care.

Dr. Brotman stressed that it is important to assess how services are being provided in order to determine the program's capability of addressing the different areas of need experienced by female addicts, including the world of family, the world of peer group, the world of work, the world of education, the world of leisure time activity, and the world of emotions.

In his conclusions, Dr. Brotman reiterated the idea that a conceptual scheme or paradigm makes it possible to see where we are not comprehensive, i.e., the areas that need attention if we are to be successful in providing the services required by our patients or in making them accessible to these clients. This does not mean that all programs need to provide comprehensive services, but rather, it gives us a clearer understanding of areas that need to be investigated and developed further in order that optimal services be available in a program or through appropriate, monitored referral.

Review Issues and Planning Strategies

The symposium participants discussed issues regarding the treatment of pregnant addicts and their children and considered steps that could be taken to address the issues. The following subject areas were covered:

Followup Evaluation
Treatment Procedures and Models
Development of Standardized Instruments for Measurement of Neonates
Child Development
Parent Training
Training and Technical Assistance Needs

These subject areas served as a focus for discussion, but, as the reader will see, during the course of the free exchange of ideas in one area matters of concern in other areas were raised. In preparing this summary of an extensive period of discussion, we have endeavored to retain the narrative flow of the exchanges.

Followup Evaluation

The group discussed the need for followup evaluation studies to determine what happens to the children of parents who were treated in methadone programs. It was decided that the first step should be to pool all of the information that has been obtained thus far by different programs--including Dr. Wilson's 5-year study, Dr. Stryker's 18-month study, and the followup studies being conducted by Drs. Lodge, Davis, Finnegan, and Ackerman. Dr. Davis indicated that she has followup data on 200 cases and considers this a primary area of her work at the Children's Hospital National Medical Center in Washington, D.C. Dr. Lodge said that she has data on 45 infants born to addicted mothers. It was also suggested that new followup programs should be organized to obtain information not included in ongoing studies. However, it was clear to the participants that there is a need for additional information on the status of followup studies currently being conducted at different institutions before one could determine precisely the type of research that should be conducted in the future. Dr. Davis stated that long term followup was still required to evaluate the safety of methadone for both the mother and her child.

Dr. Dubin described some of the issues reviewed by the Methadone Treatment Review Board, a Federal Government committee composed of representatives from NIDA, FDA, DEA, and the VA. He noted that this committee was currently considering the need for followup studies of children born to addicted mothers. This committee serves as an advisory group to other agencies regarding methadone. It therefore could have considerable influence, since recommendations of this group go directly to the Commissioner of FDA, the Directors of different ADAMHA institutes, and other Federal agencies. There was an agreement to form a committee to work out the arrangements for a meeting with the Methadone Treatment Review Board. Drs. Finnegan and Brotman agreed to coordinate this effort and organize a planning meeting.

Treatment Procedures and Models

A set of procedures or treatment models that other institutions and agencies could use was discussed. Dr. Brotman said that there was a need to describe in detail the processes and procedures involved in intake, screening, diagnosis, development of treatment plans, application, and aftercare and follow-up. Dr. Davis said that it was important to define the minimum medical care required by pregnant addicts in different specialty treatment areas including gynecology, obstetrics, pediatrics, psychiatry, internal medicine, and pharmacology.

Dr. Brotman also felt that drug treatment cannot be standardized for all patients. It must be demonstrated to the Federal Government that the 15-year-old pregnant addict is a high risk patient requiring more attention and care. He stated that more attention is being given to the people being referred by courts with treatment as an option to going to jail, than to other high-risk patients. Dr. Lodge emphasized the need to establish protocols for different types of patients while at the same time giving consideration to demographic variables. Dr. Mondanaro said that she is concerned that much of what is being demonstrated in different treatment programs does not apply to different areas and it is important to be cognizant of the needs that exist in different areas. She recommended that steps should be taken to consider how the research and demonstration activities and findings get interpreted in counties that do not have the necessary equipment and staff to provide comprehensive care. Dr. Mondanaro also indicated that it was important to develop better methods of communicating and interpreting what is being done and what is currently being learned.

She found that the attitudes and approaches in various intensive care units were different. It was learned that there were different methods of handling the infant's withdrawal symptoms in different areas. Some hospitals use high doses of Valium and the period of hospitalization varied by area and hospital.

Dr. Davis suggested that there should be stronger Federal regulations governing programs that are dispensing methadone to pregnant women. She was concerned about the need for all programs to secure adequate gynecological and obstetrical care early in the pregnancy. It was urged that methadone programs should be mandated to insure adequate care to pregnant women. Dr. Davis indicated that drug treatment programs should perform pregnancy tests on individuals admitted to methadone maintenance clinics, in order to develop a treatment protocol. She also felt that it was important, during the initial diagnosis, to determine how many children the pregnant addict already had. She found in her program that the average pregnant addict already had between two and three children.

It was agreed that FDA and other government agencies need to devote more time and attention to the pregnant addict. It was decided that representatives of this group should now be in a position to give testimony to FDA regarding potential problems and the need for new regulations. To do this, it was recognized that there was a need for research data to buttress any presentation.

Mr. Beschner stated that there was a considerable amount of information available as a result of the treatment and research work that has been performed in the programs represented. He suggested that there was a need for a manual describing the basic elements of treatment required for pregnant addicts which this experience and research suggest. It was pointed out that there are many institutions and agencies in this country attempting to treat pregnant addicts without access to the knowledge and instruments that have been developed.

Dr. Finnegan said that she would be interested in working on such a project, since she had already produced some material in this area. The manual will consist of sections authored by individuals who have had extensive experience in particular specialty areas. It was decided that the manual would be organized so that it would be applicable to different types of settings.

Several recommendations were made on the substance of the manual including sections devoted to detoxification, screening, management of the client, medical and psychological services, parenting, problems experienced in addition to pregnancy that need to be addressed during the pregnancy, child care, and aftercare. It was decided that Dr. Finnegan and Mr. Beschner would meet to work out plans for producing the manual.

Development of Standardized Instruments for Measurement of Neonates

Dr. Brotman stressed the importance of developing standard indices for measuring the physiological state of the infant after birth. Several programs including Philadelphia General Hospital and New York Medical Hospital have developed their own instruments.

Dr. Finnegan recommended that this work group should consider both the assessment and management of the newborn since, in assessing the newborn, there is a direct relationship to treatment. It was pointed out that most institutions do not as yet have any detection mechanism and are not in a position to provide useful data. Dr. Finnegan felt that there was a need to consider the involvement of other people in the field who were not attending this symposium.

Child Development

Dr. Finnegan stressed the need to give more attention to the future developmental problems of children born to addicted parents. It was pointed out that there is insufficient data on the long-term effects of maternal drug use and passive drug dependency and withdrawal on the development of these children. It is well known that children born to heroin-addicted parents have a higher incidence of prematurity, emotional disturbance, learning and mental deficiencies. However, it is unclear to what extent this is directly due to the pharmacological action of drugs. Additionally, life threatening malformations are more commonly found in undersized infants.

Dr. Mandanaro mentioned that disruptions in the mother-child relationship are often experienced after the birth of the addicted infant. There is an impact of the separation that takes place while the child is receiving intensive care for withdrawal symptoms. It was also indicated that children of pregnant addicts are more irritable, "colicky," and hyperactive as a result of their physiological reactions. Hence the children may be more difficult to manage during infancy.

Dr. Stryker added that the lifestyles and living environments of methadone mothers are generally inappropriate for the child's development. A high percentage of the mothers are not prepared emotionally and psychologically to provide the kind of care required, and they generally lack the necessary financial resources and family support needed for successful parenting. The quality of the mother's care-giving behavior must also be assessed in light of reports in the literature regarding inadequate mothering, child abuse and neglect, and other negative experiences described by treatment programs.

In considering the need for child development programs, the participants agreed that the programs represented should collaborate in the following areas:

1) conduct longitudinal studies of children's behavior during the neonatal period;

2) develop standardized battery of instruments to measure maternal-child interaction and the physical, social, and emotional development of the child in the early years;

3) develop more effective models of early intervention; and

4) establish closer working relationships with educational institutions and community agencies responsible for child development programs.

It was pointed out that these activities are currently taking place at the various institutions represented including Philadelphia General Hospital, Hutzel Hospital, New York Medical College, Baylor Medical College, and other institutions. It was agreed that the first step in the collaborative process will be to encourage direct communication among program specialists engaged in child development work in these projects.

Dr. Mondanaro pointed out that many concerns, particularly about children of pregnant addicts, were expressed by the symposium participants, but they have had little impact on the drug treatment field. She felt that the care of the child is still considered a secondary priority in drug treatment. It was mentioned that treatment services for the children of addicts are not considered as direct service to a client by some funding agencies, and there are currently few resources for funding these services. It was felt that when there are reductions in funding, such as recently experienced, the child care center and other essential developmental components are generally the first to be cut in the budget. Dr. Mondanaro said that it was becoming more widely recognized that the addict's child is at high risk and potentially the addict of the future, yet child care services receive low priority. She stressed the importance of

producing evidence from these programs about their utility in order to have impact on future legislation and influence the policies of funding agencies.

Parent Training

Dr. Brotman emphasized that there was a need for curriculum development for parenting training. He felt that this program area should be developed as a special program, separate and apart from child development. He mentioned that the early case studies showed the importance of this service and that it is often overlooked by treatment agencies. Dr. Brotman pointed out that there were problems in getting financial support for the education of patients in parenting, since it was not considered as a treatment service by funding agencies. The New York Medical College, for example, has been unable to obtain third party reimbursement for parenting services. Dr. Brotman felt that parenting services were an important component in the comprehensive program offered by the College.

Dr. Finnegan indicated that she plans to address these parenting issues in her new grant proposal. She added that the Philadelphia General Hospital program was still in the early stages of developing a parenting program. It was pointed out that addicted mothers may be potential child abusers, since they very often lead disruptive lifestyles.*

Dr. Davis added that it should be recognized that the bonding between the mother and the child is not completed at a single point in time. It involves a long-term process which begins in the neonatal period. Consequently, it is important to understand the special needs of these patients for aid in the task of parenting. They often continue to live disorganized lives after they leave the hospital with their children.

Dr. Davis stated that she found that the staff's efforts to facilitate the adaptation of the mother to her new role in the prenatal period contributed directly to the success of the parenting services offered postnatally.

According to Dr. Finnegan, the Philadelphia program attempted to use a team approach to determine which mothers were of greatest risk to their children and thus required staff intervention. Dr. Finnegan said that her program was interested in developing a parenting assessment scale. In counseling sessions with the mothers, the nurses and community workers recorded the mothers' parenting abilities. Dr. Finnegan indicated that the basic tools have been developed and that concrete steps need to be taken so they can be tested and utilized by other programs.

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* Massachusetts Committee on Children and Youth Study Report dated June 1973. It was reported that most children of drug-addicted mothers suffer from one or more of the damaging circumstances listed by the Child Welfare League of America as calling for protective services. This list includes but is not restricted to child abuse. The Committee concluded that drug-addicted infants should be classified "high risk" and require protective services. (Page 32.)

Dr. Brotman stated that there was a responsibility to produce and disseminate widely a report showing what has been learned in the research and demonstration settings regarding parenting, so that others in the field can adopt and utilize this knowledge. Drs. Lief, Mondanaro, Wilson, and Finnegan agreed to collaborate on this project.

Dr. Brotman recommended that a work group be organized to prepare a training curriculum on parenting. He said that in addition to the development of manuals, the work group should construct training modules. It was agreed that training and technical assistance would be more useful if it were delivered by people with experience.

It was mentioned that the paper on parenting delivered by Dr. Lief was strikingly different from some of the others in that it stimulated hope and provided specific methods of improving the parent-child relationship. Dr. Lief said that the New York Medical College made an enormous investment in the parenting component of the program. This program involving the mother, the father, and the child focuses on the culture of the clients. Dr. Brotman said that in establishing this component it was important to bring the culture of the neighborhood into the hospital. The parenting program offers the promise of preventive intervention, in that it is aimed at fostering the development of high-risk children rather than in treating pathology.

In stressing the importance of physicians attending to the socioemotional dynamics of these families, Dr. Brotman pointed out that there are physicians in the hospital who do not know what goes on between the mother, father, and baby in the parenting component. To facilitate the training of physicians in this aspect of primary care, glass partitions were installed around the parenting room so that the medical students could observe the parenting activities.

In describing the start of the New York Medical College parenting project, Dr. Brotman said that the staff was not sure that the addicted mothers would enter the program. Of particular concern were the women who had hustled on the street, but they did make an investment. He mentioned that the fathers attend parenting meetings one evening a week and take an active role in the sessions. Dr. Brotman indicated that, as a result, treatment and evaluation tools are now being developed by the program that will be useful to the drug field.

Training and Technical Assistance Needs

Dr. Brotman recommended that the group give some attention to the subject of staff development and training, since these are crucial for patient improvement. Adequate staff training and development are factors in the success of the New York Medical program.

Dr. Mondanaro said that she felt that training and technical assistance for programs were required and that there was a degree of urgency in making them available. She mentioned that special protocols should be developed for those dispensing methadone to pregnant addicts. The standards and regulations established regarding the treatment of pregnant addicts are inadequate, according

to Dr. Mondanaro, and many programs are using their own poorly evaluated protocols. It was indicated that programs treating pregnant addicts are generally not monitored appropriately and in many such programs the methadone is being dispensed without adequate followup to determine effects during pregnancy. Dr. Mondanaro pointed out that the programs represented at the symposium represent the very best care that is being provided in the country. Most pregnant addicts are not involved in specialized treatment programs designed to meet their needs. It was pointed out that in studies conducted in San Francisco, similar to those in other areas, remarkable differences were found comparing pregnant women addicted to heroin with pregnant women who were maintained on methadone. She underscored the point that although considerable data has been produced, it is scattered and unintegrated. There is still very little known about pregnant addicts, about the effect of drugs on the mother and her child, and about long term treatment outcomes. What is known must be compiled and made available to developing programs.

Dr. Mondanaro said she received telephone calls from all over California requesting technical assistance and information during the time she supervised a withdrawal program. It was clear that most clinicians did not have the information or knowledge required for the effective management of these patients. She noted that these professionals read the journals, but they could not integrate the kind of information being published into clinical practice. They had access to the information coming out of large cities such as New York and Chicago, but were not getting a clear or consistent picture of the methodologies that could be applied in their own areas. Dr. Mondanaro stated that two deaths related to heroin and the failure to provide appropriate medical care were recently reported in Fresno County, California. In investigating the deaths, it was learned that one program could not find a gynecologist who would hospitalize a woman addicted to heroin at 8 months of gestation. The program was afraid to give her methadone and she ended up having a stillborn baby within 2 weeks.

Dr. Mondanaro related the difficulties she had in securing funds for training drug treatment program personnel in the special service required by the pregnant addict. She said that finally people from the Department of Health visited her clinic after viewing the children and the treatment being provided. They recognized the need for special training and became interested in sponsoring a statewide training program. She described her training program, which is organized in three stages. The training program designed by Dr. Mondanaro is oriented to show how staff members can assume different roles to make sure that different service components are coordinated. Technical assistance is provided showing how the State Medical Program can be used to support services.

The primary purpose of the first stage is to provide information to program staff. Training seminars were organized in each county involving personnel from drug treatment programs and hospital staff involved in treating pregnant addicts. The seminar involves a slide presentation depicting the withdrawal routine and the child birth program.

The participants then have described for them the components of the services program. This generally includes the following:

1) small group discussions;

2) parenting groups for women and their spouses;

3) counseling groups; and

4) coordination of services provided by a gynecologist and obstetrician.

In addition, a comprehensive treatment program is described showing how such a service approach can be developed in their own communities utilizing existing resources.

The second stage is to go back to the community after there has been an attempt to develop a treatment protocol and provide technical assistance in its implementation.

The third stage involves collecting and analyzing data on a statewide basis and providing feedback to the communities. The costs to the community for this program are negligible.

According to Dr. Mondanaro, the frequent failure of methadone programs to take appropriate action in treating pregnant addicts was due to the fear of doing something wrong clinically. In California, she went on, the State regulations were changed to mandate that pregnant addicts should have prenatal care before they get methadone. Dr. Mondanaro said that some programs have misinterpreted this regulation and will cut off methadone if the patient doesn't go for prenatal care. The regulation however was established to put pressure on the program to insure that the woman has adequate care and not to punish patients. Staff training is required to assume that the intent of regulations is understood and means for their implementation are developed.

It was mentioned by Dr. Mondanaro that problems vary in the counties that do not have intensive care units for the treatment of these infants. She said that in some counties they are fortunate to keep the baby in a hospital for 3 days. They cannot get the babies into intensive care units in some areas unless the baby is in severe withdrawal and then a helicopter is sometimes used to pick them up. She found that there is much more of an investment in measuring change and evaluating outcomes after delivery in urban areas.

Development of Treatment Models

The following matters concerning the development of treatment models for the field occupied the participants in the following discussion:

1) What kinds of treatment models can be developed for pregnant addicts and their children?

2) What kinds of teams make best utilization of staff and facilitate the systematic delivery of services?

3) What is the most appropriate role of the physician in the team approach?

Dr. Brotman felt that there was a responsibility to develop a comprehensive treatment approach, and for demonstration programs such as PAAM to provide an example of how services can best be delivered when all of the resources are available. The importance of having a comprehensive system that could be implemented in other hospitals was stressed by Dr. Brotman.

Dr. Davis was concerned about the limited resources of service providers in many settings and that there was a need to consider how available resources might be allocated in a realistic way. She felt that the comprehensive service model for pregnant addicts could not necessarily be replicated by other organizations and institutions. Most do not have all of the services in one place and available at the time when clients need them. Dr. Davis also raised questions about the amount of time physicians generally have available to participate in team activities and the proper utilization of a specialist's time. It was pointed out that psychiatrists, neurologists, obstetricians, and gynecologists cannot devote sufficient time to team activities. She suggested a modified team approach in which the physician who is only available on a part-time basis, provides leadership, a sense of direction, and periodic evaluation for the team.

Dr. Davis raised the problem of inefficient use of professional staff, particularly the involvement of specialists in tasks for which they do not have particular training and expertise. She pointed out that, though there are few pediatric neurologists involved in clinical service and research in this area, she was tapped to administer a program because of the unavailability of other people. She emphasized that a comprehensive model may be unrealistic in many settings and that effectiveness from a cost-benefit point of view has not been adequately demonstrated.

Dr. Mondanaro indicated that different types of team approaches can be practical and cost-effective, if based on good planning and coordinated utilization of available resources. She stated that there are few places in the country in a position to offer comprehensive care to pregnant addicts in a single setting, particularly when you move away from the medical school setting and when you don't have the benefit of research grants. However, Dr. Mondanaro suggested, there are ways of organizing teams on a functional basis, making best use of limited time that specialists have available. She emphasized the point that comprehensive care does not mean that everyone has to be located under one roof and available 40 hours a week. She described an approach used in a San Francisco county in which the teams were composed of nurses, social workers, and nonprofessional health care workers as well as a physician who worked with all of the teams. The health care worker had the primary responsibility for making home visits. The physician functioned as a generalist providing training and consultation to the other team members, and handling special medical problems. She mentioned that, because of budget reductions, the teams eventually had to do without the physician's regular participation, requiring the other staff to assume additional functions. Dr. Mondanaro mentioned that physicians are generally only available for short

periods of time in drug treatment programs. Therefore, they may have little impact on a program unless their time and services are well planned.

Dr. Kreek stressed the need to look ahead and plan for the next decade. New treatment models that are not based on stratification and specialization need to be created. Dr. Kreek stated that there should be flexibility and not just an effort to conform to a set of standards or regulations passed down or dictated from above. In addition, she felt that it was more important to be committed to the principles of humanity, and not just a set of traditional guidelines.

Dr. Stryker said that in attempting to implement treatment models it is most important to hire people with appropriate attitudes toward the patient population and therefore program administrators must consider the criteria that need to be applied in selecting staff for these programs. It is also important to work out a plan for training staff for this type of work, since these skills were not taught in medical school and are considered only briefly in the training of other staff members such as nurses and social workers.

Dr. Kreek felt that there was a tendency to fractionalize service rather than move toward the established comprehensive care models that could be implemented in the field. HEW is compartmentalized and the grant mechanism is oriented toward the funding of small independent programs. Researchers in the field need to be in a position to reach the public and make the alternatives clear. In treating the pregnant addict, one of the choices is comprehensive health care but this is costly. However, the social costs involved, where a coordinated system of services is not provided, also need to be made clear.

In discussing the need to develop a variety of treatment models, there was agreement on the following points:

1) In working with the high risk pregnant addict population, physicians must be flexible and willing to change their perceptions of the roles. They must be willing to assume different roles as well as a primary care function.

2) Regardless of the comprehensiveness of the approach taken, consideration must be given as to how to link the different units of required services both within institutions and across service and delivery settings.

3) There is a need to demonstrate treatment effectiveness and the issue of cost-effectiveness must be addressed in relation to specific objectives.

4) There is a need to demonstrate how the time of different specialists can best be utilized in a team approach.

5) It was agreed that there was much in common among the different programs regarding the screening and entry process, the referral process, the interview and counseling process, and in the development

of treatment plans. It was obvious that much could be learned from the experiences of each of the participants if they were formally exchanged and shared.

Other Issues

There were a number of other issues identified and considered by the group, but there was not sufficient time to review them in depth. Instead, it was decided that additional meetings should be planned to find ways and resources to address these issues.

Dr. Mondanaro focused on the problems associated with pregnant women abusing other drugs including tranquilizers, barbiturates, amphetamines, alcohol, and cigarettes. It was her understanding that investigators had found that babies born to women who had abused PCP (Phencyclidine), a veterinary anesthetic, had serious birth defects. Dr. Mondanaro stated that there was a need to look at the different types of drugs used and abused by women, their distribution patterns, the reasons for their use, and the consequence of use to individual users and others to whom they were related, including children and other family members. Dr. Mondanaro suggested that it was important to give more attention to nonopiate detoxification and the treatment of addicted women in drug free modalities. She mentioned that the nonnarcotic drug problems were not receiving enough attention in the research being conducted by the programs represented. It was pointed out that there were programs throughout the country engaged in detoxifying pregnant women who used polydrugs.

Drs. Davis and Stryker discussed the need to study the use and abuse of other drugs by pregnant women enrolled in methadone maintenance programs. It was pointed out that several of the research/demonstration projects have reported that a significant number of their patients have used other drugs including heroin, barbiturates, amphetamines, cocaine, marihuana, mescaline, and alcohol. It was agreed that there was a need for studies in this area focused on the following:

1) the relationship between the methadone dosage level and the use of other drugs;

2) the reasons why pregnant women use additional drugs;

3) the problems associated with drug interaction, the woman and her fetus;

4) the effect of different drug combinations on the delivery; and

5) the relationship between the mother's drug use pattern and the condition of the newborn.

Drs. Davis, Mondanaro, and Finnegan spoke on the importance of giving more attention to family planning. It was mentioned that the majority of women seen in the pregnant addict treatment programs had repeated unplanned pregnancies. There appeared to be an average of more than two such pregnancies for each woman. The participants agreed that there were a number of complicating fac-

tors that needed to be reviewed in considering family planning programming. These include:

1) Addicted women generally do not live structured lifestyles and often fail to keep appointments.

2) Drugs (including methadone) influence the menstrual cycle.

3) The birth control methods that are available are usually not accepted by these women, and comprehensive programs have difficulty dealing with this issue.

4) Women tend not to participate regularly in aftercare services.

Dr. Mondanaro stressed that treatment programs needed to be more creative in their family planning efforts. It was also suggested that appropriate birth control counseling should be built into the counseling services provided to women by all methadone programs.

Dr. Brotman and several representatives from his staff discussed the need to study the various potential sources of support for services to the pregnant addict including third party payments. It was indicated that this type of study should include support available for parenting and child development services as well.

It was agreed that some attention should be given to the role of educational institutions in providing special services to the children of addicted parents.

The participants also recognized that little attention had been given to the need for community education programs to increase public awareness of the potential danger of drugs to pregnant women and their offspring.

Dr. Davis felt that the symposium provided a forum to consider steps that should be taken to produce change. It is clear that, to be effective with the pregnant addict and her child, a range of services are required. She felt that the programs represented were in the best position to identify the treatment needs and demonstrate the most appropriate methods of addressing these needs. Ultimately, it is Congress that must be influenced--particularly the committees that produce legislation in the health areas.

Dr. Brotman stated he thought it might be appropriate to establish less ambitious goals in order to have a more immediate impact on the policies of NIDA, NIAAA, NIMH, FDA, the Social and Rehabilitation Services Administration, State, and city agencies. He felt that the public, at this point, is not particularly concerned about the comprehensive health care issues. He stressed the importance of testifying before officials who are in a position to influence decisions. He gave an example of a situation in which a pregnant addict is arrested, goes to jail, and detoxifies cold turkey. The physician could have described the treatment approach that would be more effective and how this approach will benefit the woman and the criminal justice system. He pointed out that with good planning there were many things that could be done to produce change that did not require money.

Ms. Henderson indicated that it was possible to get the attention of legislators and people in policymaking roles. She indicated that there was interest in these groups in obtaining new information on these issues so that appropriate actions could be taken. It was pointed out that the Committee on Juvenile Delinquency was particularly concerned about the female addict because of their delinquency and the high risk of their offspring for delinquency as well. A problem is that these people are not familiar with current research efforts and findings, material which could influence their decision-making.

The participants agreed that there was a need for organization, clear objectives, and more know-how in order to be in a position to influence Congress and administrative agencies.

Closing Remarks

Dr. Loretta P. Finnegan made some remarks at the end of the symposium that reflected much of the participants' thinking:

In attempting to deal with these issues and get the attention of politicians and policymakers, it is important to focus on the social cost. Infant mortality statistics and parental problems are very high in this population. Addiction in pregnancy has become an important health problem in the United States due to the increased incidence of obstetrical and medical complications experienced by these women, and the high rate of low birth weight infants with other untoward sequelae.

The death rate of the low birth weight infant is 40 times that of a full size infant born at term. The incidence of cerebral palsy associated with prematurity may be 10 times, mental deficiency 5 times, and lethal malformations in undersized infants 7 times that of a full size infant. Emotional disturbances, social maladjustments, and visual and learning deficits also have multiple incidencies. There is no way to adequately calculate the medical and social costs these infants incur.

A few years ago, it was estimated that it took approximately a quarter of a million dollars to support a mentally retarded child through life. We need to focus in on these kinds of statistics and their implications in order to make people aware of the problem and how it directly effects us all.

It has been pleasing to me to look at the work being done by the six programs represented at this symposium and to recognize that there are others engaged in similar research and demonstration work. We all recognize the need to provide special care for these patients, so this type of advocacy will not be a cry in the wilderness. We have found that there are methods and approaches that have worked. Some have concentrated on specific issues and advanced in certain areas more than others, and we can learn from their particular expertise. Some of us have been working on instruments that have already been developed and tested by others. For example, I was going to spend the next 6 months preparing an index similar to the one that has already been developed by Dr. Green. Certainly it is unnecessary to spend time and effort to do something that has already been done so well.

The symposium has been a fruitful one and I hope that now we can move forward with the implementation of our findings and ideas in the same spirit of cooperation that was evidenced at this meeting.

3. RESEARCH PAPERS

In the course of the symposium several research papers were presented by participants. These papers are presented in this section of the proceedings. Many of the presentations were prepared especially for the symposium; some, however, were based upon previously developed reports. The topics discussed cover a broad spectrum and provide a rather comprehensive perspective of the many issues related to, and some of the alternative approaches being applied to, the problems of addicted mothers and their children.

A Unique Situation—Two People Must Be Considered: An Overview of the Hutzel Hospital Program

Joan C. Stryker, M.D.

The program at Hutzel Hospital began with 8 patients in the fall of 1969. As of May 1, 1976, 1,044 babies were delivered of mothers who were admitted to the clinic with positive evidence of heroin addiction. The pregnant addict methadone clinic is a unique situation, one that does not fall into the regular treatment program categories that have been established by the government. Consequently, a pregnant drug addict clinic is at loggerheads regarding many of the government regulations.

Prenatal Period

The aim of the clinic is to produce healthy nonaddicted infants. To produce such a neonate it is necessary to have a healthy nonaddicted mother. The ideal goal of this program is to have the mother completely detoxified, but this is not frequently obtained. The present more practical goal is no street drugs and less than 20 mg. of methadone 8 weeks before term.

We have learned that we must see patients immediately upon their first contact with the clinic because they have little patience and will leave. The admitting chart includes routine prenatal laboratory tests, plus urine drug screen and biochemical profile. It is also important to obtain three names and addresses of friends and relatives, and to check on the validity of this information. This type of data is mandatory to trace the patient in attempting to follow up for "no shows" at the clinic.

Following the obtaining of laboratory and social data, the resident in obstetrics and gynecology does the history and physical examination. This is followed by a prenatal risk evaluation, using a modification of Nesbit's Antenatal Risk Scale. All patients are high risk, of course, simply because they are addicts. In addition, most patients have the other medical or obstetrical complications which put them into the category of ultra-high risk. Infection and malnutrition were the major pathological conditions. Other complications were abscesses, amnionitis, hepatitis, thrombophlebitis, and acute toxemia. The clinic has had a higher incidence of both tuberculosis and venereal disease. Adequate screening tests should be performed on all such patients. The venereal disease rate is understandably higher in the pregnant drug addict clinic than in the regular prenatal clinic.

One of the physicians assigned to the methadone clinic does the intake drug interviews, which includes past drug history, previous methadone dosage, and a past history information from other clinics. Obtaining information from other clinics is difficult because of the issue of confidentiality, although extremely helpful.

When new patients are enrolled in the clinic they are personally introduced to the nurses who will see them daily, and to the social worker. The social worker talks to them at that point and makes arrangements to see them at least once a week. There are also group meetings with all patients once a week. These rap sessions are geared to discuss well baby care, prenatal hygiene, nutrition, labor and delivery, and daily living problems. These sessions are supervised by either the social worker or a psychologist, and each group consists of 4 to 8 people. The "give and take" reinforces the program aims and helps to alleviate the patient's fears. Audiovisual aids are employed in information-giving sessions.

Methadone is picked up daily. The time of the daily pickup is an important opportunity for program monitoring for the nurse is able to counsel the patient on keeping appointments. Frequently the nurse is the first person to observe pathological behavior, or the need for immediate social work or psychological assistance.

A regular weekly staff meeting is indispensable. It is here that the problem case can be reviewed with the social worker, nurses, psychologist, resident, and consulting psychiatrist. The regular staff meeting is important for communication and solving of administrative problems. It is also here that current drug dosages can be re-evaluated. A major problem in drug dosage monitoring in our program is the turnaround time for urine screenings. There is a lag of at least 2 weeks which may seriously interfere with proper evaluation of the patient's progress. If our aim is gradual detoxification, then one must know if a patient has had to "chip" and this delay in getting information is clinically disruptive.

Labor and Delivery

The pregnant drug addict who is in labor requires the same care and medication as does the nonaddicted patient. One of our difficulties on the case floor was the delay in obtaining the prenatal chart, especially on weekends and evenings. To alleviate this difficulty a small 3" X 5" card is available in the admitting room (of the case room) which contains all the pertinent data regarding the patient. This then gives the resident an insight into the patient's particular problems when she commences labor. A resident has been assigned to us on a 3-month basis. The resident follows the patient in the prenatal clinic and assists us with the postpartum patients and regulation of methadone dosage.

Postpartum

The patients are admitted to the regular postpartum floor. They room with other not necessarily addicted patients, and they adapt very well. Both the social worker and the MIC/PRESCAD nurse visit the patients on the postpartum floors.

In terms of neonatal care, urinalyses are performed on all newborns, plus morphine and quinine analyses on the placenta. Suspected neonates are examined by Doctor Chavez, who is an expert on neonatal drug addiction. Any baby suspected of being addicted has a Brazelton test after 24 hours, which is then repeated at 3 and 7 days. Once the babies are discharged, they are assigned to the well baby clinic. If a pediatric problem develops, they are sent to Children's Hospital, which is within the Detroit Medical Complex. Dr. Chavez is on the staff there, has round privileges, and can follow the patients there. Thus there is continuity of pediatric care through routine development and illness.

In the family planning clinic patients are given the opportunity to receive medroxyprogesterone-acetate. This is one family planning method that the patients accept; we have a 30 to 40 percent continuation rate. Some of our patients have a continuation rate of over three years and have not developed any pathology. Few patients request tubal ligation or abortion.

One pressing problem that I see at the present, which seems almost insurmountable, is the patient who backslides--that is, who goes back into the drug scene, or, for some reason, requires a substantial increase in methadone dosage. Perhaps this might be occurring because we have the patients with us for only a short period of time, usually 10 months, and this really does not allow enough time for adequate rehabilitation. The patient tends to become very bored staying home to care for an infant: she has no new lifestyle to become interested in and as a consequence, backslides.

At the present we have approximately 150 babies and mothers who have been studied quite extensively, both prenatally and postpartum. Their babies are given well baby care and are being followed with Brazelton and Bayley tests. The mothers are encouraged to avail themselves of vocational guidance and a chance to change their lifestyles. It is hoped to carry this group of patients for at least 5 years. Some of these babies are now entering into their second year of life.

In summary, the approach of the clinic can be briefly characterized: a pregnant addict is two people, and in all aspects of clinic procedures and care, this fact must be paramount.

APPENDIX

OVERVIEW AND STATISTICAL DATA

ON THE HUTZEL PREGNANT DRUG ADDICT PROGRAM

SCHEDULED PROGRAM FOR A PREGNANT DRUG ADDICT CLINIC

"A Unique Situation--Two People Must Be Considered"

Aim: To develop healthy mothers, who if possible can be detoxed, and use no street drugs, and produce nonaddicted infants at birth.

Hutzel Hospital Clinic: Appointment--as soon as possible. (PDA's are impatient.)

Chart with lab results--drug screen, biochemprofile, and routine prenatal
Three names and addresses/friends and relatives
Intake interview
Physical history and exam
Risk evaluation
Methadone intake if on methadone
Mechanism for information from another clinic
Methadone dosage

Prenatal literature
Prenatal classes

Return prenatal visits as necessary

Hutzel Hospital Annex: Patient's introduction to Methadone Clinic

Nurse--daily contact
Social Worker--about 1 x week

Group meeting with all new patients once a week

Literature--aim--nonaddicted babies
Meeting personnel
Clinic requirements
Audiovisual

Once enrolled

1) Daily attendance for mother's pick-up of methadone
2) Group rap sessions with psychologist
3) Well baby and prenatal lectures
4) Social worker input
5) Psychological first visit and assessment
6) Peer rap session

Wednesday P.M. Staff Meeting

Review problem patients
Methadone daily pick-up attendance
Random urine results
Dosage re-regulated at end of 2 weeks
Gradually detoxed if possible

Hutzel Hospital
Labor and Delivery: Visited by clinic resident for methadone dosage

Visited by social worker and DMIC nurse

PDA's are high-risk patients

Hutzel Hospital
Nursery: Neonatal Care: Dr. Chavez

Identifying the Addicted Neonate:
1) Mother's history
2) Urine analysis
3) Unsuspected addicted neonates
4) Signs and symptoms of addiction
5) Brazelton test

Treatment of addicted neonate--length of hospital stay

Causes:
1) Low birth weight
2) Meconium aspiration
3) Infection

Hutzel Hospital
Well Baby Clinic: For all babies who are eligible

Bayley test--Neuromuscular test

Hutzel Hospital
Family Planning: Continuation of mothers in Hutzel Hospital's Pregnant Drug Addict Clinic for methadone maintenance or detoxification

Vocational testing and rehabilitation

Refer to another methadone clinic

TABLE I

COMPARISON OF PREGNANCY OUTCOME

Pregnancy Outcome	HUTZEL HOSPITAL P.D.A. CLINIC Number (931)	Ratio* Live Births- (875)	DETROIT P.H.D. STATISTICS-1973 Ratio*
Not Pregnant (Incl. Amenorrhea)	11		?
Aborted Spontaneous	11		?
" V.I.P.	3		
Prematures	115	131	44.0
Stillborn	20	23	16.6
Neonatal Death	14	16	17.7
Infant Death	13	15	25.0
L to F.U.	11		

Infants Living 9/1/75 = 746

* Ratio per 1,000 live births.

TABLE 2

DELIVERED PREGNANT DRUG ADDICTS
AT HUTZEL HOSPITAL

(Enrolled in Methadone Program)

1969	1970	1971	1972	1973	1974	1975	1976 (thru May)
2	50	163	201	218	158	192	80

TOTAL: 1,064

TABLE 3

HUMAN NEONATAL ADDICTION
BABIES' ADDICTION IN RELATION TO MOTHERS'
METHADONE EIGHT WEEKS PRE-DELIVERY

	N	L	M	S
Total Patients	28	94	11	5
		Percentage of Patients		
Tang	26	11	9	0
5-15 mgs.	46	55	18	60
20 mgs.	11	17	36	20
25-35 mgs.	3.5	7	0	0
40-50 mgs.	3.5	1	10	0
Nonattendance	10	9	27	20

N = Normal
L = Little-Mild
M = Moderate
S = Severe

TABLE 4

INCIDENCE (%) OBSTETRIC COMPLICATIONS

Variable	Addicts (72)	Clinic Controls (36)
Pre-eclampsia	0	0
Eclampsia	1.4	0
Placental infarcts	1.4	5.6
Blood loss		
Trimester 1 or 2	1.4	0
Trimester 3	4.2	2.8
False labor	1.4	0
Premature rupture of membranes	11.1	5.6
Premature separation of membranes	5.6	2.8
Placenta previa	1.4	2.8
Threatened abortion	0	0

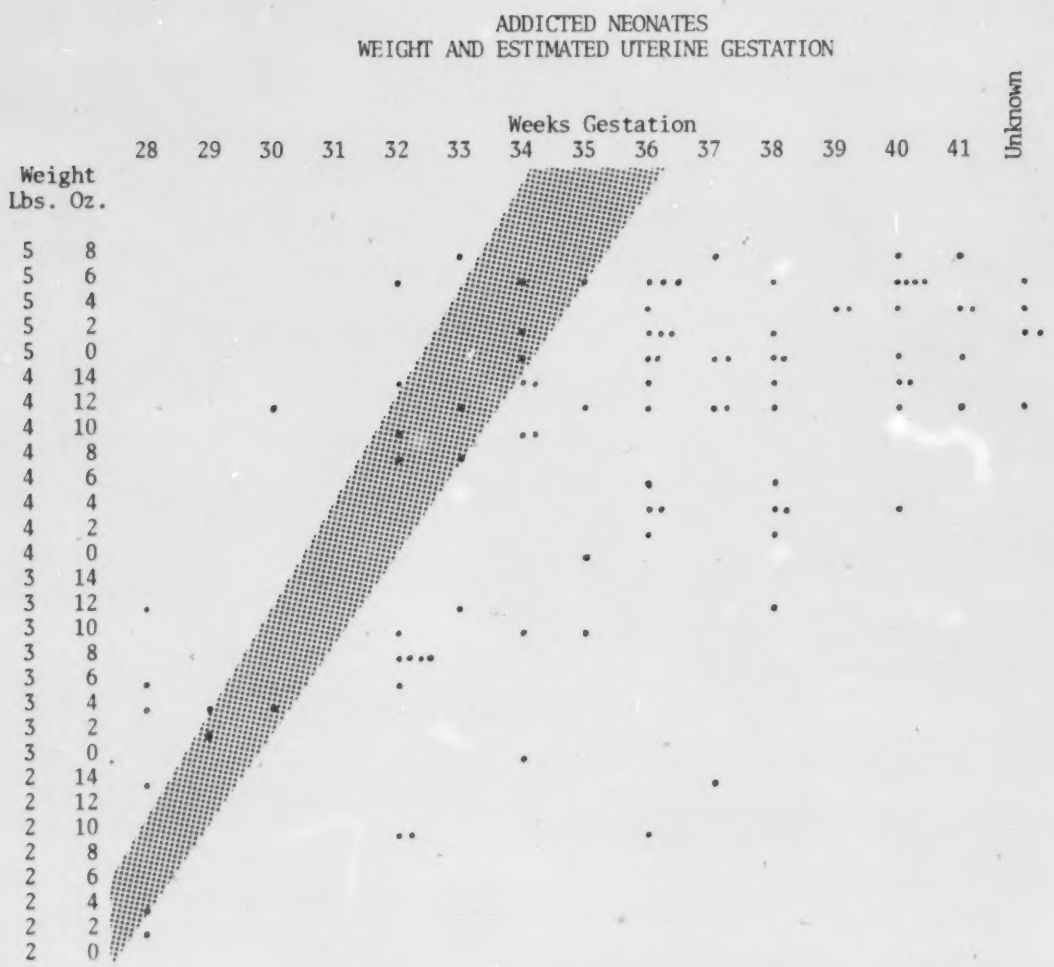
TABLE 5

INCIDENCE (%) OF ILLNESSES DURING PREGNANCY

Variable	Addicts (72)	Clinic Controls (36)
Cardiovascular disease	2.8	2.8
Hypertension	2.8	2.8
Syphilis	6.9	0
Gonorrhea	1.4	2.8
Hepatitis	1.4	0
Diabetes	1.4	2.8
Malnutrition	41.7	*
Edema	51.4	41.7
Anemia	9.7	5.6
Kidney & urinary tract infection	1.4	5.6

* These patients were not regularly referred for nutritional evaluation. The diagnosis of malnutrition was reserved for cases in which the diagnosis was made after such evaluation.

CHART 1



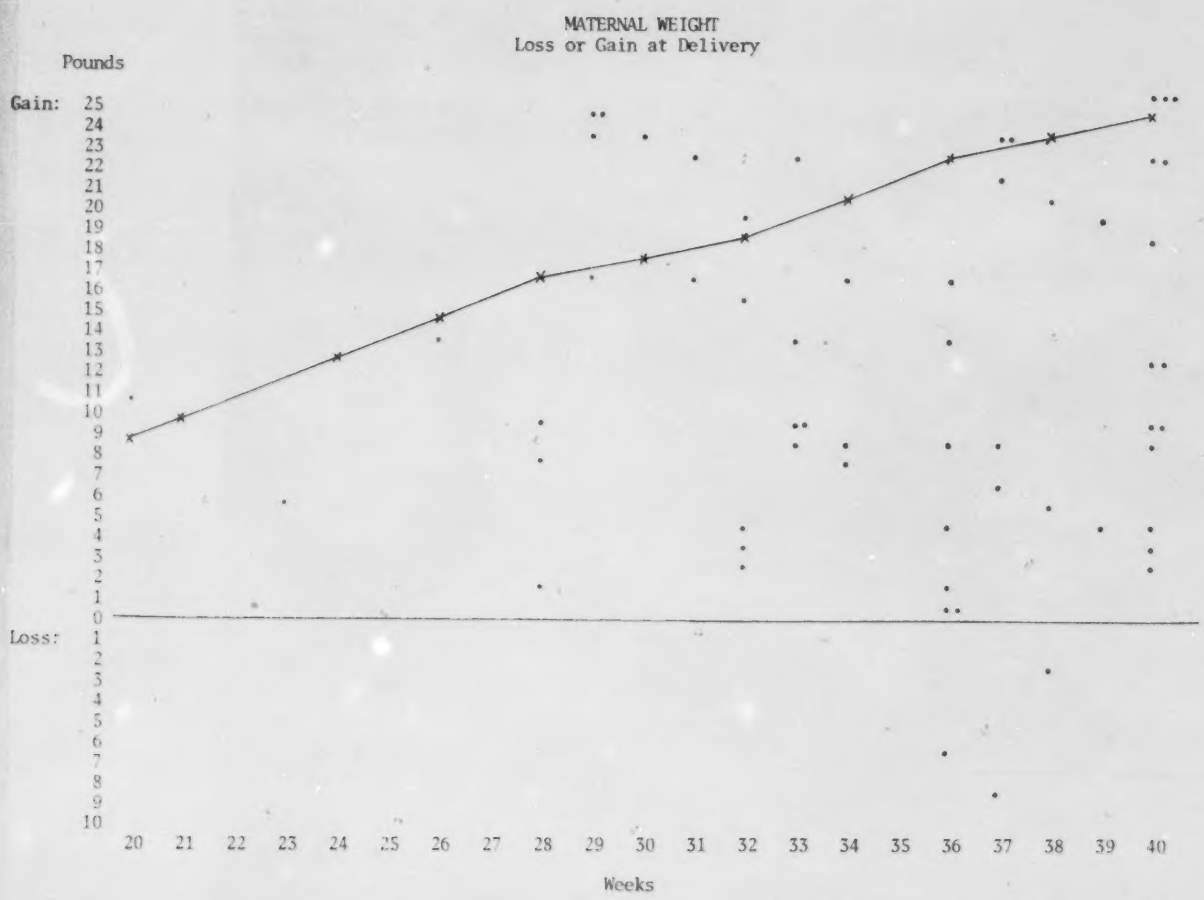
(Shaded area: Normal weight for gestational age)

TABLE 6

MATERNAL PATHOLOGY ASSOCIATED WITH LOW WEIGHT BABIES

Maternal Pathology	U.S. Incidence/ % total births	P.D.A. Clinic Incidence/ % total births
Breech	3.65	3.6
Pre-eclampsia (grade 1)	3.48	7.2
Pyelitis	3.27	7.2
Hypertension & Proteinuria	1.39	2.4
Premature Separation	1.26	3.6
Pyelonephritis	0.63	0
Diabetes Mellitus	0.60	0
Phlebitis	0.57	0
Placenta Previa	0.57	2.4
Prolapsed Cord	0.48	0
Hydramnios	0.47	0
Eclampsia	0.08	4.8
Anemia		45.8
Syphilis		19.2
Gonorrhea		16.87
Poor Nutrition		65.0
General Infection: Bacteria		8.4
Viral Hepatitis		6.0
Local Infection		38.5
Poly Drugs		1.0
Multiparity		3.6
Previous Premature Delivery		17.0
RH Negative		11.0
Sickle Cell - A.S. or S.S.		3.6
Abnormal Cervical Pap Severe Dysplasia to Ca. In Situ		7.2

CHART 2



(———— = Normal prenatal gains in weight from Michigan Department of Public Health used for all DMIC patients.)

TABLE 7

MOTHER'S DRUG HABIT
IN LOW WEIGHT BABIES

Years	Percent
Less than 1	2.9
1 to 2	11.0
2 to 3	31.0
3 to 4	25.0
4 to 5	2.0
5 to 6	8.0
6 to 7	4.3
7 to 8	5.8
	100.0

TABLE 8

MOTHER'S DRUG HABIT
IN LOW WEIGHT BABIES

Dirty Urines	Percent
Yes	71
No	29
	100

Methadone Dosage at Delivery	
Tang	22
5 mg.	21
10 mg.	25
15 mg.	10
20 mg.	8
25 mg.	0
30 mg.	8
40 mg.	1
Nonattendance	5
	100

ANTENATAL RISK INDEX

NAME: _____ HOSPITAL #: _____ DATE: _____ EDC: _____

SOCIAL	SCORE
Maternal Age:	
Below 15	2
15-19	1
20-29	0
30-34	0.5
40 & above	2
Race/Marital Status:	
W	0
NW	0.5
S	0.5
M	0
Emotional Survey: (Grade 0-1 based on fear, attitude, hostilities, etc.)	
Psychiatric care:	
Present	2
Past	1
Social-Economic Survey:	
Welfare	1
Low income - ($4,000)	0.5

GYNECOLOGICAL DISORDERS	
Problem Paps	2
Vaginal Disorders -	
Congenital Anomaly	2
Adenosis	2
Vaginitis	1
Incompetent Cervical Os	2
Myoma	2
Pelvic Mass	2
Congenital Anomaly of Uterus	3

PAST OBSTETRICAL HISTORY	SCORE
Parity:	
0	1
1-3	0
4 & above	0.5/ea.
8	2
Fetal Morbidity-Mortality:	
Abortion - (V.I.P.)	
1	0
2	0.5
3	1.0
(Spontaneous)	
1	0.5
2	1.5
3	3.0
Premature -	
1	1
2	3
Fetal Death -	
1	1
2	3
Neonatal Death -	
1	1
2	3
Congenital Abnormality-	
1	1
2	4
Damaged Infant - Physical	1
Obstetrical Disorders:	
Involuntary Sterility-	
Less than 2 years	1
More than 2 years	2
RH Sensitivity	3
ABO Incompatibility	1
Menstrual Dysfunction	1
Prior Fetal Malpresentation	1
Prior Cesarean Section	3
Contracted Pelvis -	
Borderline	1.5
Contracted	3
Postpartum Hemorrhage	2
Venereal Disease -	
G.C. - Treated	0.5
Untreated	2
Syphilis - Treated	0
Untreated	2
At term	3
Condyloma Acuminatum	2
Herpes	1

MEDICAL DISORDERS	SCORE
(General)	
Acute-mild	0.5
Acute-serious	1.5
Chronic nondebilitating	2
Chronic debilitating	2
Family genetic disorder	2
(Special)	
Diabetic:	
Pre	1
Overt	2
Chronic Hypertension:	
Mild	1.5
Severe	3
Nephritis	4
Heart Disease:	
Class 1-2	1
Class 3-4	3
H/Prior failure	3
Endocrine Disorders:	
Thyroid	3
Adrenal	3
Pituitary	3
Infection:	
Urinary -	
Acute	1
Chronic	2
Thrombophlebitis -	
Chronic	2
Acute	3
Pulmonary -	
T.B.	2
Other	2
Substance Abuse:	
Drugs	3
Alcohol	2
Nutrition:	
Malnourished	3
Very Obese	3
Inadequate Diet	1
Anemia:	
Hg. 10-11	0.5
Hg. 9-10	1
Hg. under 9	2
Sickle Cell:	
AS	1
SC	2
SS	3

PATIENT'S TOTAL SCORE _____

RISK FACTOR _____

KEY: 0 - 1.5, Low Risk; 2 - 3, Moderate; 3.5 - 5, High; 5.5 - 10, Ultra High

Rev. 10/76

Some Measures of Parenting Behavoir for Addicted and Nonaddicted Mothers

Nina Lief, M.D.

Introduction

The purpose of this paper is to report some preliminary findings concerning the effectiveness of a parenting program for addicted mothers. The program's origin, structure, and purposes will be described in the first section. Next, the development and content of a parenting rating scale used in the program will be discussed. Finally, the scale will be applied to compare changes over a 3-month period in the parenting behavior of a group of addicted mothers and a group of nonaddicted mothers who participated in the parenting program.

Setting

The Department of Psychiatry of New York Medical College began its parenting program in 1969 with groups of mothers at a child health station in the East Harlem section of Manhattan. A number of other sites have since been developed. The newest of these, called the Early Childhood Development Center (ECDC), in Manhattan's Yorkville section, was opened in 1974. The nonaddicted mothers discussed in this report were one of a number of parenting groups started at ECDC. The addicted mothers' group is composed of patients on our Pregnant Addicts and Addicted Mothers program (PAAM) in East Harlem. PAAM offers comprehensive medical and social services to pregnant addicts and their families, and the addicted mothers' parenting group is an integral component of the program.

Operation

The parenting program, comprising both sites, is directed by a child psychiatrist. Other staff include psychologists, a sociologist, other professionals trained in early childhood development, and trained volunteers. The operation of the program is the same at all sites. A mother begins the program when her baby is about 4 weeks old and continues until the child is 3 years old. About 8 to 10 mothers with their children meet weekly in a group led by one of the child development specialists and a volunteer assistant leader. Discussion in the groups centers on the physical, emotional, and social development of children and the parents' roles in fostering and enjoying that development. Topics change, of course, with the age (stage of development) of the children in the group.

Goals

The curriculum is eclectic. We have tried to incorporate into it all that seems most suitable from our study of the child development literature. The works of Gesell, Bowlby, Erickson, Mahler, Deutsch, Pavenstedt, Burton White, and Ainsworth, to name a few, have been influential in curriculum development. We have put this knowledge into a framework which mothers can acquire and apply in practice first in the group, then at home, and then back into the group again, etc. In some child development programs, the goal is to teach specialists how to take care of *other* people's babies. Our goal is to teach mothers and fathers to take care of their *own* children with the competence and assurance of professionals.

This approach has several benefits which are concomitant with the healthy personality development of the child. First, the group setting allows a mother to share her concerns and questions with other mothers who are going through the same experience. This communication can be very important for the nuclear family in the city, as many such families are increasingly separated both from other family and from a close community life. Second, we feel that increased knowledge on the parents' part can allay fears and uncertainty about the task of child caring and rearing, and that this understanding of development can lead to real enjoyment in parenting. Third, the approach can yield cumulative results as parents apply their learning to the raising of subsequent children. Fourth, the longitudinal view achieved through continuous group contact is an ideal setting for the early detection and treatment of deficits. The support of the staff and the group can reduce the emotional strain for a family with a child with a deficit and thus may save expensive (and often unavailable) psychotherapy later. Finally, we expect that the understanding gained by participating mothers can be a first step in a career ladder for them in the child care field. Their training is directly relevant to work in day care settings, preschools, and nurseries.

For the addicted mothers we have an additional goal. Most of the addicted mothers we see come from lower class, ghetto backgrounds. As addicts, they tend to exemplify the worst consequences of that background: personality disorder, school failure, delinquency, and other social, emotional, and cognitive deficits. We believe that if addicted mothers are helped early to understand their babies' development, and are helped to apply all of the best that is known about child rearing, we can affect the mother-child interaction in such a way that the deficits enumerated above can be prevented. In short, we hope to break the intergenerational cycle of addiction.

The Parenting Rating Scale

Development of the Scale

The parenting rating scale grew out of experience in the parenting sessions themselves. When we first began the program we kept a list of mothers' concerns and found that they numbered about 90. The 90 issues were organized into 13 categories, from which was devised an instrument called the Maternal Rating

Scale. The scale is designed to measure how well the mother understands and can put into practice what is being taught.

The 13 categories themselves fall into 3 major groups. Six describe *maternal input*, that is, what the mother should do for her baby. Three deal with *maternal outcome*, that is, how the mother feels when she fulfills her child's needs and her attitude toward her role. The last four categories describe *infant outcome*, that is, what effect the mother's feelings and attention have upon the baby's social, emotional, and cognitive development.

Description of the Scale

Below are brief descriptions by category of the types of issues we address in the sessions and the types of questions we ask in making ratings. Generally, the categories are listed in the order in which they are presented in the parenting sessions, although it is clear that all the issues are relevant throughout a child's development. The issues are thus recurring themes in the curriculum, and are readdressed in turn, each time with new content relevant to the stage of development.

Maternal Input Issues

1. Physical Care. Issues addressed here include diet, hygiene, safety measures, and the proper course of health care. Assessments are made on the basis of observation, mothers' reports, and periodic physical examinations.

2. Patterning and Scheduling. The goal here is to institute a regularly organized, but not rigid sequence of feeding, bathing, play, sleep, and other items of daily life. If the schedule is consistent, the baby gets to know the sequence and develops a sense of trust. The mother, in turn, has a sense of accomplishment. This is one of the earliest tasks of mothering and one of the most difficult but most necessary to achieve. It is the cornerstone of the baby's personality organization. We assess patterning and scheduling by observation, by questions to the parents about their daily routines, and by mothers' spontaneous reports.

3. Input of Motor and Sensory Stimulation. Here we observe face-to-face interaction between parent and child, the games the parents play with the baby, their use of age-appropriate toys. If the stimulation is not adequate the child suffers sensory deprivation and may seem retarded or withdrawn.

4. Input of Language and Communication. Here we assess how and how much parents talk to the baby. Are they teaching speech sounds? Do they label? Are they patient? We show parents how to elicit a vocal response and allow for expression of feelings and later, once the child has become truly verbal, of experience.

5. Permitting Exploration. In this area we teach the parents to foster learning by allowing the baby to do things, rather than needlessly inhibiting his or her explorations of self and the world. For example, do parents allow hand-

to-mouth activity or do they constantly close off the baby's mouth with a pacifier? Do they allow exploration of space and freedom to touch? We teach them not to interrupt the child's play, but rather to be "available" for assistance. Inhibition at an early age stifles a later drive for exploration and learning.

6. Guiding Social Relations with Others. In this area of concern we encourage parents to arrange and properly supervise the child's play with peers. Do they teach the child sharing at the appropriate age? Do they show the child how to use adult resources competently? Social adjustment and competence must begin early to prevent withdrawal from appropriate social interaction.

Maternal Outcome Issues

1. Interest in Achievement and Outcome. Through an understanding of the above maternal input issues, mothers acquire a sense of participation in the child's growth. In making ratings here we try to determine if the parent values this progress and helps encourage the child to achieve his or her potential. In this process, parents move away from seeing their roles as drudges and policemen.

2. Enjoyment of Child as a Person. The input issues are also designed to help parents see the child as a person rather than as an extension of themselves. Enjoyment of the parenting experience thus becomes child centered, as the parents derive pleasure from the child's growth and development and see their roles in fostering that development.

3. Maternal Self-Concept and Role. With increased understanding, interest, and enjoyment, parents gain self-confidence. They are learning what to expect and how to accept the child's ages and stages. They come to see their roles as nurturing growth.

Infant Outcome Issues

1. Establishment of Trust in Relationships. If the child has a consistent primary caretaker, he or she will develop the capacity for trust in relationships. To measure the establishment of trust we try to determine whether the child is cared for primarily by one person or by many, whether the caretaker gives security to the child by filling the child's needs for soothing and by responding to the child's cues for attention. It appears that children who do not establish a bond early with the mother really do not develop the ability to form meaningful relationships with other people and also the ability to become involved in later learning.

2. Individuation and Separation. In this area we make mothers aware that it takes about 3 years for the child to develop individuation and separation. Mothers are ready for separation well before this, but we teach them to allow a natural development of the child's sense of autonomy, moving for separation with the child's own readiness and not pushing it.

3. Establishment of Conscience Mechanisms. This category involves teaching children what they can and cannot do. The key here is to focus on recognizing approved behavior and to give the child a sense of approval rather than disapproval, that is, making the "No's" few and the "Yes's" many. Discipline and the setting of limits should not be harsh and should be geared to the child's comprehension.

4. Development of Self-Esteem. The final benefit of good parenting is that the child develops with a good self-image and a feeling of self-esteem. Because of the recognition of his achievements by his parents, he has a sense of their approval of him as a person.

Application of the Scale in the Group

The procedure is to see mothers and babies once weekly. Each session begins with Gesell testing. Two or three children are tested each week so that by the fourth week of classes all the infants have been tested. The same pattern of testing continues over time so that each child is tested at 4-week intervals. Mothers participate in giving the test to their own children in full view of the group. The point of the Gesell testing is not primarily to achieve a numerical rating for the child (although this is done), but rather to dramatize for the mother the progress her child makes from month to month and to emphasize the uniqueness of each child's development. After each test we point out progress from the previous month. If there are lags, we point out how to overcome them. For example, if the baby does not reach for tops and if there is no organic deficit, we know that there has not been sufficient stimulation and we demonstrate the way to use the toy with the baby. When the Gesells are over we begin to discuss the issues that are appropriate for that age, for example, sleep problems, feeding schedule, appropriate play, discipline, approval. We make up the agenda for the following session from what seem to be the important items and concerns of each session.

After each session the staff gathers to review each child who has had a Gesell and evaluate the mother on the rating scale. An evaluation is done each month for each pair. Ratings are based on a five-point scale, a "five" representing the highest presence of the desired behavior, a "three" some aspects of the behavior, and a "one" representing none. The rating is arrived at by discussion and consensus of the leader, assistant leader, trained observers, and play teacher. We have checked the reliability of the scale based on individual judgments in comparison with consensus judgments and found the percent of agreement within half a point to be 73 percent. A copy of the rating form used in the program is attached after the conclusion of this report.

Findings

The findings to be reported cover the first 3 months of participation in parenting classes by a group of 8 addicted mothers and a separate group of 10 nonaddicted mothers. Most of the addicted mothers had spouses who usually also participated in the parenting groups. In the nonaddicted group, almost always only one of the parents attended. Usually this was the mother, although

in a few cases the fathers attended if the mother worked. Monthly sessions for both parents were also arranged.

The findings reported are the mean scale scores for each group at the initial rating (4- to 8-week-old infants) and at the latest rating (16 to 20 weeks). During the first 3 months of participation, only six of the twelve categories are rated: physical care, patterning, language, enjoyment of the child, maternal self-concept, and basic trust. The ratings for each group by category are shown in figure I.

Physical Care

The figures in the chart show that initial competence in matters of physical care is highest of the 6 parenting areas rated for both addicted and nonaddicted mothers. This is not surprising as there has been considerable public education concerning physical care. Also, for the new mother these issues are much more obvious and pressing than concerns covered in the 5 other parenting areas. Mothers know babies must be fed, bathed, and protected from danger. These immediate needs of the infant thus make mothers receptive to public education efforts concerning physical care.

It is interesting that in physical care the addicted mothers showed more improvement in 3 months' time and seem to have achieved a slightly greater competence than the other group. We feel that this is due to their participation in other components of the PAAM program. Opportunities for contact with members of the staff were many. All of the addicted parents attended the program daily for medication throughout the period covered, almost always in the company of the child. In addition, all had at least weekly sessions with their counselors and, in most cases, weekly visits for medical care for themselves or the child. In all of these encounters, the staff was trained to offer strong reinforcement of the parents' learning about physical care for their infants.

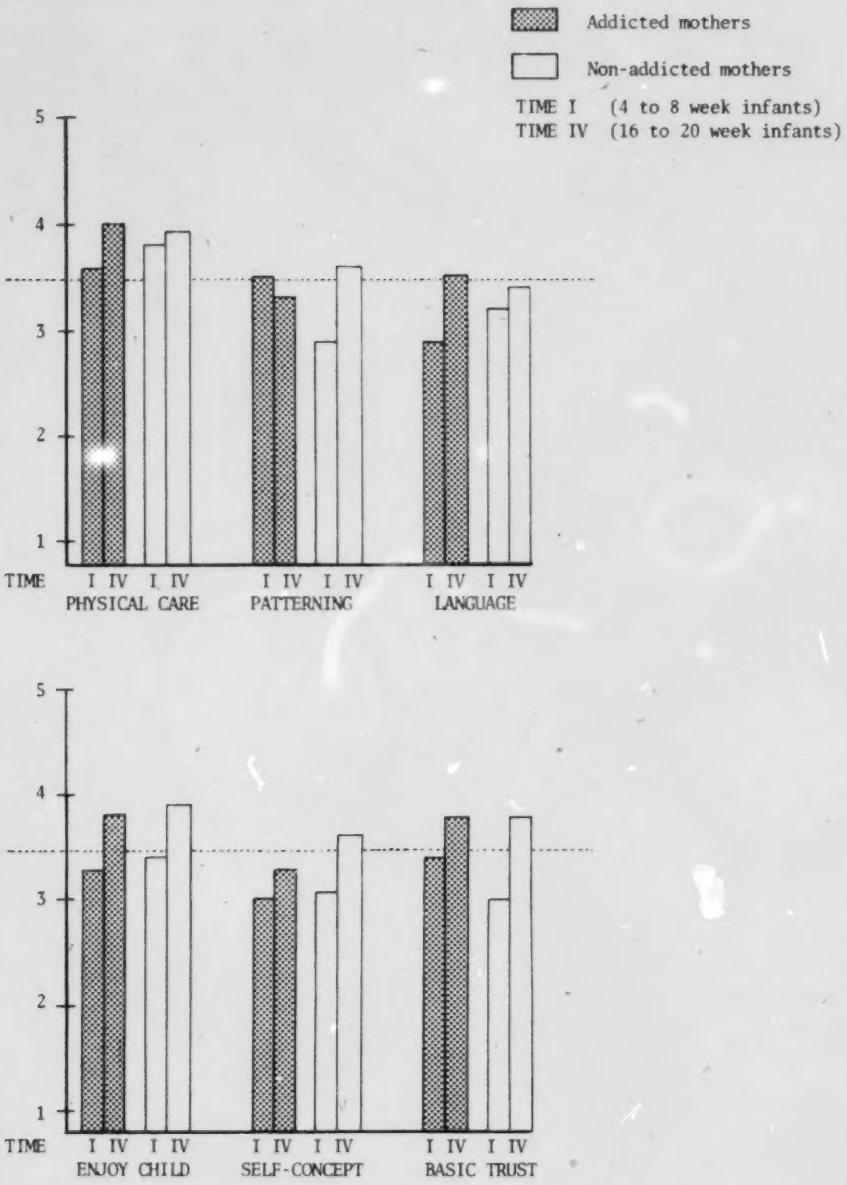
Patterning and Scheduling

This is the only parenting area in which changes in the addicted and nonaddicted groups' scores are sharply divergent. The addicted mothers began at a high level but lost ground. The nonaddicted mothers began very low but improved markedly. Our impression is that this divergence is related to the different lifestyles of the two groups, and the way that those lifestyles are affected by the birth experience. While the addict's lifestyle generally has a daily pattern, it is one that is not organized in terms of putting certain events at certain times day after day. We have found, however, that the addicted mothers' great investment in and concentration on the birth experience and a healthy baby supersede their usual pattern and induce them to keep a set clinic schedule immediately before and after the birth. Two or three months later the inducement seems to lessen, and we have observed a tendency for the addicted mothers to revert somewhat to their "normal," looser schedule. This may explain the initially good patterning ratings, followed by a decline 4 months after the birth. The nonaddicted mothers, on the other hand, were not involved

FIGURE 1

GROUP MEANS - CHANGES IN MATERNAL RATINGS FROM TIME I TO TIME IV

Addicted Mothers Compared with Non-addicted Mothers



in the rigorous comprehensive health and addiction treatment schedule immediately before and after birth. Nor were they aware when they entered the parenting classes of the importance and use of patterning and scheduling. However, after a few sessions, they became quite adept at adopting a schedule, presumably because this was more in line with the normal patterns of their comparatively conventional lifestyles.

Input of Language and Communication

We were surprised at how relatively little both groups knew about the importance of early language stimulation. Many of the mothers were not aware of how well babies can see and hear at 4 weeks, so they didn't talk to them much. The addicted mothers responded especially well in the group and even surpassed the nonaddicts in language stimulation. As with physical care, this may have been due to the reinforcement of the other staff in the PAAM program.

Enjoyment of Child as a Person

We have found in the groups that it takes time for a mother to really begin to enjoy her child. She first has to get to know the child and to adjust to his or her presence. Babies over time (especially with the learning from the groups) also became more interesting: they became people. Enjoyment of the child increases in turn. Both groups showed a good level of increased enjoyment after 3 months in the group.

Maternal Self-Concept and Role

This is a very difficult area in the early months for all mothers. Both groups began at about the same level, but the addicted mothers showed slightly less improvement. This may reflect the fact that the addicted mother has more difficult life problems and that these impinge somewhat on her self-concept.

Establishing Basic Trust

The addicted mothers began at a higher level but both groups reached the same competence by 4 months. We would speculate that the addicted mothers' good start was due to the close physical relation of *both* addicted parents to the infant. Since some of the addicted fathers were not working, both mother and father were often available much of the day to share in the child's care. As we have seen, both parents also participated in other phases of the program in addition to the child rearing sessions. Since child care was usually not available to them, they brought their babies with them to these activities. For these reasons, the addicted parents had to frequently carry and handle their babies. This physical closeness furthers the development of trust.

Conclusion

Even with the study's limited sample and time span, two broad conclusions seem warranted. First, through regular group sessions, parents can increase their knowledge, skills, and enjoyment of caring for their babies. While our prior experience had shown this for mothers in general, this study shows that addicted mothers are also capable of improving their competence in parenting and of finding increased pleasure in the task. Second, the addicted mothers were competitive not only in terms of improvement; they were also generally rated as equals in their levels of competence as parents. In neither initial nor 4-month ratings did either group have consistently higher scores than the other. A third conclusion is more tentative in that it is based on observations not included in the Maternal Rating Scale. This conclusion is that participation in other phases of the PAAM program by the addicted parents seemed to supplement and reinforce the group learning. In areas like patterning and basic trust, program participation improved initial ratings. In the areas of physical care and language development, participation seemed to augment subsequent ratings.

Each of these conclusions points to the value of a comprehensive health care program for pregnant addicts and addicted mothers. The parenting classes are only one aspect (although certainly a central aspect) of the ways in which PAAM prepares and assists addicted parents to care for their children. Overall, program participation seems both to give some initial advantages to the addicted mothers and also to reinforce the learning that takes place in the parenting groups. This seems to indicate that we do make an impact on the mothers in their dealings with their babies; that there is certainly enough evidence to pursue the continued effort to follow up these gains and see if we can maintain them. If we can, then we seem to have a method that is easily replicable and that may be a step in the direction of preventing another generation of addicts.

THE MATERNAL INPUT SCALE

1 mo 2 fa 3 oth	Name_____	Inf.Name_____	Id# _ _ _ _ Date _ _ _ _ _ _

Gesell Age Test_____ Inf.Age_____

I. SUMMARY OF INFANT'S TEST PERFORMANCE

State of Inf. at Testing.....

Test	Adva-nced	Some Advd	Avge	Some Slow	Very Slow	N.D.
1.Motor	5	4	3	2	1	0
2.Adapt	5	4	3	2	1	0
3.Lang	5	4	3	2	1	0
4.Soc-Emo	5	4	3	2	1	0

Comments on Infant

Global Rating A B C P ND

II. EVALUATION OF MATERNAL INPUTS

	high	good	some	doubt	none	n.d.
I EXPERIENCES PROVIDED						
1.PHYSICAL CARE OF CHILD Diet, hygiene, health care, safety.	5	4	3	2	1	0
2.PATTERNING & SCHEDULING Has regular sleep, feeding, bath, play routines; bedtime rituals; organized but not rigid.	5	4	3	2	1	0
3.INPUT OF MOTOR & SENSORY STIMUL'N Face to face interaction, games, supply of age approp. materials.	5	4	3	2	1	0
4.INPUT OF LANGUAGE & COMMUNICATION Patient teaching of speech & sounds; talks,labels,tutors,elicits verbal expression of feelings,experience.	5	4	3	2	1	0
5.PERMITS EXPLORATION Fosters learning by doing;allows spatial & contact freedom. Available for assistance but does not interrupt needlessly.	5	4	3	2	1	0
6.GUIDES SOCIAL RELAT'NS W/OTHERS Arranges, supervises play with peers; teaches sharing,competent use of adult as resource,etc.	5	4	3	2	1	0
II ATTITUDES						
7.INTEREST IN ACHIEVEMENT & MASTERY Values child's continuous progress; actively encourages to fill potent'l	5	4	3	2	1	0
8.ENJOYMENT OF CHILD AS PERSON Child-centered rather than extension of self; gets pleasure from child's growing and person.	5	4	3	2	1	0
9.MATERNAL SELF-CONCEPT & ROLE Self-confident as mother; accepts child's ages/stages; sees role as nurturing growth.	5	4	3	2	1	0
III DEVELOPMENTAL ISSUES						
10.ESTABLISHES TRUST & PERSON RELAT'NS One person caretaker; gives security,love; responsive to cues; fills soothing needs.	5	4	3	2	1	0
11.DEALS WITH INDIVIDUAT'N & SEPARAT'N Allows natural dev. of autonomy; moves w/child's own readiness; doesn't push separation.	5	4	3	2	1	0
12.ESTABLISHES CONSCIENCE MECHANISMS Focus on recognizing approved behavior; punishm't & limits geared to child's comprehension; not harsh.	5	4	3	2	1	0

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MR01

The Quality of Prenatal Treatment of Narcotic Addicted Women as a Factor in Neonatal Outcome

Miryam Davis, M.D.

This presentation was based upon the following paper by Miryam M. Davis, Eileen J. Levan-Goldschmidt, and Ronald H. Klau titled, "Quality of Management of the Pregnant Heroin Addict as a Factor in Pregnancy Outcome and Neonatal Course."

Introduction

It is well known that infants of narcotics-addicted mothers experience a syndrome of neonatal withdrawal--a direct, pharmacodynamic effect of *in utero* exposure to narcotic drugs. This medical risk is further compounded by psychosocial and medical circumstances associated with chronic drug abuse in the mother. The high-risk factors often observed include anemia, syphilis, serum hepatitis, toxemia, breech presentation, premature rupture of the membranes, and shortened gestation (Stone et al. 1971). Other potentially hazardous by-products of the addict's lifestyle include malnutrition, and emotional complexes of guilt and anxiety which interfere with the development of healthy and rewarding patterns of mother-child interaction (Coppolillo 1975). Green et al. (1975) have pointed out that the potentially deleterious effects of these and other adverse sociocultural factors must be taken into account in studies of long-term development. They may themselves produce deviations or deficits, which might be misinterpreted as the direct result of drug-specific actions.

The proportion of patients receiving prenatal obstetrical care is generally greater in methadone-treated groups than among untreated heroin addicts (Newman et al. 1975; Zelson et al. 1973); rates in the latter group are often as low as 20-30 percent. Several studies suggest that the provision of comprehensive prenatal care and other adjunct social services can help reduce many of the high-risk factors associated with maternal drug addiction. Strauss et al. (1974) studied the level of obstetrical risk and neonatal outcome in 72 methadone-treated patients, all receiving prenatal care. Rates of prenatal complications and low birth weight in the offspring were not different from 72 non-addicted gravidae. However, significantly fewer methadone-exposed infants required pharmacological treatment for withdrawal symptoms. Results were interpreted as showing that low dosage methadone maintenance in conjunction with

comprehensive prenatal care may reduce obstetrical risk to a level comparable with that of nonaddicted women of similar sociomedical circumstances. However, Strauss' methadone-treated patients may have shown atypically favorable outcomes because they had, in most cases, used heroin by "snorting" rather than intravenously prior to treatment.

Harper et al. (1974) described a comprehensive Family and Maternal Care Program for pregnant addicts established at the State University of New York, Downstate Medical Center. Provision of high-quality obstetrical care and intensive psychosocial services in this program reduced or eliminated many of the common problems associated with addiction in pregnancy. However, in a series of infants studied, 33 percent were of low birth weight. Ninety-four percent developed withdrawal symptoms, and 6 percent convulsed repetitively. No evidence of increased mortality or prolonged infant morbidity was found. The authors conclude that the intensive intervention provided greatly reduced medical and psychosocial problems in the patients but did not eliminate hazard to the infant.

Chappel et al. (1972) compared infants born to mothers treated either with methadone detoxification, methadone maintenance, or methadone plus psychosocial support. The latter subgroup, although showing an incidence of 91 percent of withdrawal symptoms, had the best outcomes in terms of birth weights, followup rates, and avoidance of abandonment by the mother.

This clinical and research evidence suggests that the mother's psychological, medical, nutritional, and social well-being during pregnancy can significantly influence the outcome of her infant, although narcotic withdrawal symptoms appear to occur as a drug-induced effect independently of associated high-risk factors. These studies, however, have not reported the incidence of illicit abuse of heroin and other psychoactive drugs in the patients, a factor which may complicate or increase the severity of neonatal abstinence symptomatology (Davis et al. 1973).

We postulate that the quality of medical management and comprehensive treatment services provided to the pregnant heroin addict is a critical factor affecting pregnancy outcome, both in terms of offspring survival and spectrum of morbidity in the resulting infant. A change in clinic facilities provided for the Perinatal Treatment Program (PTP) of the Narcotics Treatment Administration, Washington, D.C., which occurred in June 1975, enabled a test of this hypothesis. While treatment guidelines and the structure of care delivery remained basically the same in the two clinic environments, the location of the PTP Clinic changed. At the same time there was a reduction in the staff/patient ratio and diminution in psychosocial services to patients.

Materials and Methods

Prior to 1973, the Narcotics Treatment Administration (NTA) of the Government of the District of Columbia provided to pregnant heroin addicts the same treatment services offered to all other patients. Recognition of serious complications among these women, some fatal to their offspring, led to the elaboration

and implementation within NTA of special treatment guidelines. Early detection of pregnancy in both new and continuing patients was emphasized, followed by prompt referral to the special PTP Clinic. Here, centralized low dosage methadone treatment was provided along with an upgrading of care to all gravidae. This separate clinic facility operated in a location away from the city's drug traffic areas. Under a medical director and a counselor-nursing team/patient ratio of 1/10-12, the clinic provided, from December 1973 to June 30, 1975, intensive medical, nutritional, and nursing care, prenatal classes, group therapy, and other services. This facility will be referred to as "Clinic A."

On July 1, 1975, budgetary constraints led to loss of the separate perinatal clinic and transfer of the program to a facility which already housed a large narcotics treatment clinic in the midst of a heavy drug traffic street corridor. While treatment guidelines and structure of care delivery remained basically the same, the ratio of staff/patient fell to 1/20-25. Personal counseling and social services were drastically reduced due to the greatly expanded caseloads of the remaining staff. This clinic will be referred to as "Clinic B."

The present paper compares the course of pregnancy, pregnancy outcome, and morbidity in the offspring among patients who attended the two clinics. The purpose of the study is to investigate whether changes in patient and infant outcomes were associated with this reduction in adjunctive services.

Subjects

Clinic A patients (N = 22) delivered their infants during the period from July 1, 1974, through June 30, 1975. They received all prenatal treatment at the Clinic A facility. Clinic B patients (N = 15) delivered their infants from September 1, 1975, through March 30, 1976, receiving all of their treatment at the Clinic B facility. Patients delivered of infants between July 1, 1975, and September 1, 1975, were not included in this study because they received part of their care at each clinic facility at various points in their pregnancies.

There were no significant differences between the two groups of mothers in their age at delivery, race, or educational level (table 1). The mothers' mean age at delivery was 26.6 years and 25.3 years in the Clinic A and Clinic B groups, respectively. Both groups were predominantly black and averaged approximately 10 years of formal education. A trend was observed for Clinic B patients to be single (80%) whereas Clinic A patients tended to be separated or married (50%).

Procedures

The treatment modality received by the two groups was similar. Mothers were maintained on the lowest dosage of methadone which prevented withdrawal symptoms. Once the patient was stabilized at a particular dosage level, and refrained from supplementing on heroin or other illegal drugs, her methadone

TABLE 1

MATERNAL CHARACTERISTICS

Variable	Clinic A Group (N = 22)	Clinic B Group (N = 15)	p	Statistical Test Used
$\bar{x}$, Age in years	26.6 ± 4.3	25.3 ± 3.1	n.s.	$t < 1.0$
Ethnic Group				
% Black	95.5 (21/22)	86.7 (13/15)	n.s.	Fisher Exact Probability
% White	4.5 (1/22)	13.3 (2/15)		
Marital Status				
% Single	50.0 (11/22)	80.0 (12/15)	$p < .10$	$x^2 = 3.42$ (Single vs. Sep. or Married)
% Separated	36.4 (8/22)	6.7 (1/15)		
% Married	13.6 (3/22)	13.3 (2/15)		
$\bar{x}$, Educational Level in years	10.95 ± 1.8 (N = 21)	10.20 ± 3.5	n.s.	$t < 1.0$
Percent Distribution of Patients-Years of Education				
Less than 9	9.5 (2/21)	20.0 (3/15)		
9 - 11	47.6 (10/21)	33.3 (5/15)		
High School Graduate	33.3 (7/21)	33.3 (5/15)		
More than 12	9.5 (2/21)	13.3 (2/15)		
Percent Distribution-Trimester of Pregnancy Patient Entered Obstetrical Care				
1st Trimester	9.1 (2/22)	14.3 (2/14)	n.s.	$x^2 < 1.0$ (1st or 2nd vs. 3rd)
2nd Trimester	50.0 (11/22)	35.7 (5/14)		
3rd Trimester	40.9 (9/22)	50.0 (7/14)		
$\bar{x}$, Length of patient's obstetrical care, in days (First prenatal visit to delivery of infant)	107.3 ± 55.0 (N = 21)	107.3 ± 49.5	n.s.	$t < 1.0$
$\bar{x}$, Mother's gestational weight gain, in pounds	23.74 ± 10.2 (N = 19)	11.88 ± 20.3 (N = 8)	$p > .10$	Mann-Whitney $U = 50.5$
$\bar{x}$, Average methadone dosage in pregnancy, mg.	18.3 ± 7.3 (N = 19)	16.1 ± 5.4	n.s.	$t = 0.97$
$\bar{x}$, Methadone dosage at delivery, mg.	18.2 ± 7.8 (N = 20)	17.0 ± 6.0	n.s.	$t = 0.52$

dosage was gradually reduced to the lowest possible level, thus minimizing the level of risk to mother and fetus. Dosages ranged from 5 mg./day to 35 mg./day with a mean dosage level of approximately 18 mg./day.

All patients were enrolled voluntarily in a study on the long-term development of methadone-exposed offspring funded by the National Institute on Drug Abuse (NIDA). Through this project, the mothers received personalized, high-quality obstetrical care, through Medicaid insurance and at no cost to the NTA agency, at either the George Washington University Medical Center or its satellite, the Columbia Hospital for Women, under the same Department of Obstetrics. In addition, one of the authors (M.M. Davis) evaluated all mothers prenatally and followed their infants through serial neurological examinations from birth onward. (See Davis and Shanks 1975.) Comprehensive pediatric care was also provided through the project.

Data for the present study were obtained by review of the subjects' medical charts at the Drug Treatment Clinic and at their hospital of delivery.

Results

Maternal Obstetrical Variables

Patients in both groups entered prenatal care at approximately the same stage of pregnancy (table 1). Roughly 50 percent of each group had the first prenatal visit prior to the third trimester. The mean length of prenatal care was the same in both groups, 107.3 days. There is apparent variability in the average gestational weight gain of the two groups, much of which is due to one Clinic B patient who lost 35 pounds during pregnancy. The distributions, however, were not significantly different (Mann-Whitney $U = 50.5$, $p < .10$).

Maternal Drug Intake

As indicated previously, all women received methadone treatment at the lowest possible doses, titrated as much as possible during pregnancy. Dosage levels of mothers in the two groups were compared using two measures (table 1): First, the total amount of methadone each mother received was calculated and divided by the number of days she attended clinic. The average dose was 18.3 mg./day for Clinic A mothers, and 16.1 mg./day for Clinic B mothers, not a statistically significant difference. The second comparison was of the mother's dosage level at the time of delivery. Again there was no difference between the two samples: Clinic A patients averaged 18.2 mg./day and Clinic B patients averaged 17.0 mg./day.

The observations of medical treatment personnel in the clinics, including the medical director and the treatment coordinator, suggested that the transfer to Clinic B was associated with increased incidence of heroin and polydrug abuse, particularly amphetamines, concurrent with methadone intake by the patients. Several objective and subjective methods were used to monitor maternal drug intake. Patients were interviewed regularly to elicit self-reports of drug

intake, and staff observations of the mother's state of alertness and behavior patterns, when indicative of recent drug use, were recorded. Urine specimens were randomly obtained once to thrice weekly, without prior notice to patients, and analyzed by technique of gas-liquid chromatography (GLC) for presence of drug metabolites.

Based on these data, patients were categorized according to patterns of prenatal drug intake (table 2). The most striking finding here is that 60 percent of the Clinic B patients regularly and frequently supplemented their methadone dosage with illicit heroin abuse throughout pregnancy. Another 20 percent of Clinic B mothers began frequent heroin abuse during the latter stages of pregnancy (subsequent to 29 weeks). These rates are considerably greater than those corresponding to Clinic A mothers. A statistical comparison was made of the percentage of mothers in each group who abused illicit narcotics (usually heroin) on a regular and frequent basis at any time during pregnancy. The Clinic A and Clinic B group rates were 47.6 percent and 86.7 percent, respectively; a clearly significant difference (Fisher Exact Probability = 0.018).

TABLE 2

INCIDENCE OF ILLEGAL DRUG ABUSE IN PREGNANCY
(Percent)

	Clinic A Group (N = 21)	Clinic B Group (N = 15)
Polydrug abuse only, frequent	38.1 (8/21)	13.3 (2/15)
Polydrug abuse only, infrequent	9.5 (2/21)	0.0 (0/15)
Heroin abuse in early pregnancy only (up to 28 wks.), frequent	9.5 (2/21)	0.0 (0/15)
Heroin abuse in early pregnancy only (up to 28 wks.), infrequent	0.0 (0/21)	6.7 (1/15)
Heroin abuse in late pregnancy only (after 28 wks.), frequent	4.8 (1/21)	20.0 (3/15)
Heroin abuse throughout pregnancy, frequent	28.6 (6/21)	60.0 (9/15)
Heroin abuse throughout pregnancy, infrequent	4.8 (1/21)	0.0 (0/15)
No polydrug or heroin abuse	4.8 (1/21)	0.0 (0/15)

Infant Characteristics

The most significant finding distinguishing the two groups was that 20 percent of Clinic B pregnancies resulted in either a stillbirth or neonatal death; these outcomes were not observed among Clinic A patients (table 3). Since the sample sizes are small, this difference is only a statistical trend (Fisher's exact $p < .064$). The lack of psychosocial supportive services in the Clinic B setting, with the concomitant increase in maternal heroin and polydrug abuse, appeared to increase the level of medical risk to the survival of the fetus and infant.

Among liveborn, surviving infants, Clinic B newborns revealed several unfavorable characteristics. A statistical trend was found toward longer periods of initial hospitalization among Clinic B infants (table 3). They averaged 33.0 days compared with 21.3 days in Clinic A infants (Mann-Whitney $U = 91.5$; $p < .10$). As to the severity of neonatal withdrawal, nearly twice as many Clinic B infants (54.5%) as Clinic A infants (28.6%) required pharmacological treatment for symptoms. A trend was also revealed for Clinic B infants to have lower Apgar scores at 1 and 5 minutes of life than those of Clinic A infants, but the incidence of scores lower than 7 did not differ significantly.

Discussion

An important finding of this study is that transfer of the methadone Perinatal Program from a separate, well-staffed clinic to a larger facility located in a heavy drug-traffic, inner-city area, with reduction in psychosocial supportive services, resulted in greatly increased maternal abuse of heroin and other psychoactive drugs. Clinic staff members remarked that the Clinic B setting lacked the small group atmosphere found at Clinic A, diminishing the peer group pressure against illegal drug use. In addition, the capacity of counselors to work with the mothers was severely limited because of their increased caseloads. The resultant increase in maternal drug abuse is cause for considerable concern in view of evidence that greater total dosages of narcotics prenatally (methadone and heroin included) are associated with reduced birth weight in the offspring, more severe and prolonged neonatal abstinence symptomatology, and perhaps other hazards to the infant (M. Davis et al 1973; R. Davis et al. 1975).

The second salient finding is the incidence of fetal loss among Clinic B mothers. While the specific causes of this increased mortality are not yet fully known, impaired general maternal health, effects of malnutrition, and increased abuse of heroin and polydrugs among Clinic B mothers may be involved. In addition, Clinic B patients may have suffered greater adversity related to economic deprivation--e.g., lack of housing, difficulties obtaining public assistance--due to the lack of social work services in the Clinic B facility.

The greater neonatal morbidity among Clinic B infants is consistent with our clinical observation that complications tend to be more severe in those infants of addicted patients with greatest prenatal illicit drug abuse. This is reflected in longer periods of initial hospitalization and increased numbers of

TABLE 3

INFANT CHARACTERISTICS

Variable	Clinic A Group (N = 22)	Clinic B Group (N = 15)	p	Statistical Test Used
Pregnancy Outcome				
% Live Births	95.5 (21/22)	80.0 (12/15)	p = .064	Fisher Exact Probability
% Miscarriage	4.5 (1/22)	0.0 (0/15)		
% Stillbirth	0.0 (0/22)	6.7 (1/15)	(< .10)	(Live Birth vs. Stillbirth or Neonatal Death)
% Neonatal Death	0.0 (0/22)	13.3 (2/15)		
$\bar{x}$, Birth weight of term infants (≥ 38 wks. gestational age), in grams	2967.6 ± 392.6 (N = 15)	2953.2 ± 520.4 (N = 6)	n.s.	t = 0.07
$\bar{x}$, Gestational age, in weeks	38.33 ± 2.6	37.46 ± 2.1	n.s.	t = 1.01
Incidence of low birth weight (< 2500 gm.)				
% under 2500 gm.	28.6 (6/21)	30.8 (4/13)	n.s.	$x^2 < 1.0$
% ≥ 2500 gm.	71.4 (15/21)	69.2 (9/13)		
Rate of prematurity (< 38 wks. gestational age) (%)	28.6 (6/21)	53.8 (7/13)	n.s.	$x^2 = 2.17$
Rate of extreme prematurity (< 35 wks. gest. age) (%)	9.5 (2/21)	15.4 (2/13)	n.s.	Fisher Exact Probability
$\bar{x}$, Birth weight, all infants, in grams	2799.5 ± 533.9 (N = 21)	2636.5 ± 750.3 (N = 14)	n.s.	t = 0.75
Incidence of pharmacological treatment of narcotic abstinence syndrome in infant (%)	28.6 (6/21)	54.5 (6/11)	n.s.	Fisher Exact Probability
Length of infant's hospitalization, $\bar{x}$, in days	21.3 ± 9.6 (N = 21)	33.0 ± 24.8 (N = 12)	p < .10	Mann-Whitney U = 91.5
$\bar{x}$, Infant's Apgar Score at one minute	8.14 ± 1.3 (N = 21)	6.77 ± 3.0 (N = 12)	p < .10	t = 1.84
Incidence of Apgar < 7 at one minute (%)	4.8 (1/21)	15.4 (2/13)	p > .25	Fisher Exact Probability
$\bar{x}$, Infant's Apgar Score at five minutes	9.05 ± 1.0 (N = 21)	7.62 ± 3.2 (N = 12)	p < .10	t = 1.90
Incidence of Apgar < 7 at five minutes (%)	4.8 (1/21)	15.4 (2/13)	p > .25	Fisher Exact Probability

infants requiring pharmacological treatment in the Clinic B group. These infants also tended to show lower Apgar scores at 1 and 5 minutes of life, although the incidence of depressed Apgar scores was not significantly different between the two groups. While not statistically significant, the rate of premature infants was nearly twice as great in Clinic B patients as in Clinic A patients.

In summary, loss of treatment staff and facilities resulting from budgetary cuts, despite high motivation of depleted staff, resulted in derogation of hard won gains in maternal and infant outcome, with resultant 20 percent loss of offspring, significantly increased neonatal morbidity, and breakdown of the mother-child unit. The small budgetary savings involved here obviously resulted in far greater economic and human wastage. The decrements observed in Clinic B patients are all the more alarming because these patients, despite the lack of services in the methadone clinic, were still receiving superior, personalized obstetrical and pediatric care, at no cost to the Narcotics Treatment Agency. This care was provided in conjunction with a NIDA-funded research project investigating long-term effects of narcotics on the developing nervous system of the exposed fetus and child. Nonetheless, subjects availed of similar medical care but attending the better staffed and located facility showed a consistent trend toward improved course and outcome, and ability to provide more responsible mothering.

Review of similar studies by other workers in this field (Davis et al. 1973; C. Ramer et al. 1974; B. Ramer et al. 1973; Finnegan et al. 1973; R.C. Davis et al. 1975; Harper et al. 1974) and the findings of this study raise serious questions regarding the safety and benefits of methadone treatment of pregnant addicts unless minimal standards of delivery of care are carefully defined and implemented.

It seems reasonable to propose that pregnant addicts, while the smallest fraction of any narcotic treatment program, are at such high risk prenatally and postpartum that their care requires a centralized facility with skilled staff, and available and mandatory obstetrical and pediatric services. Further elaboration and recommendations will, it is hoped, develop during this meeting.

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Management of the Drug Dependent Pregnancy & Effects on Neonatal Outcome

Loretta Finnegan, M.D.

This presentation was based upon a paper of similar title by Loretta P. Finnegan, M.D., Dian S. Reeser, James F. Connaughton, M.D., and Jacob Schut, M.D.

Introduction

Over the past few decades, many investigators have reported on the numerous complications that have occurred when pregnancy is complicated by narcotic addiction. These complications have arisen from the lifestyle of the pregnant woman abusing drugs which generally includes the total lack of self-care and the nonexistant medical supervision during the prenatal period. For many years the medical profession was unable to prevent the numerous complications seen in these women, because they usually did not seek any medical care until the onset of labor. By this time, they had suffered the many complications seen in women lacking care during pregnancy. These have included preeclampsia, placental accidents, and the onset of premature labor with the resultant birth of a very small infant frequently presenting as a breech. The many problems seen with breech presentation are well known and include the possibility of a traumatic delivery as well as the effects of birth asphyxia.

Along with the obstetrical complications seen in these women, medical complications secondary to prolonged intravenous drug administration were extremely high. These included cellulitis, thrombophlebitis, serum hepatitis, and abscesses. Moreover, venereal disease, malnutrition, anemia, infections, skin disorders, and dental caries were commonly seen.

In addition to these obstetrical and medical complications, social and emotional problems abound in this group. Therefore, it was essential to provide a comprehensive approach which would specifically meet the needs of drug abusing pregnant women while also attempting to reduce morbidity and mortality in both the mother and infant. Family Center, at Philadelphia General Hospital, was designed to meet these needs. The method of patient management includes evaluation by obstetricians, internists, psychiatrists, psychiatric social workers, public health nurses, and community workers. These health workers coordinate the addicts' obstetrical, psychosocial, and addictive care. The

addictive care is arranged according to the patients' needs; some are managed drug free, while most have chosen methadone maintenance.

Controversy concerning the use of methadone by pregnant women has developed in the past few years. Therefore, while using this mode of treatment in Family Center, we have been carefully monitoring the effects of methadone on the pregnant woman and her newborn infant in comparison to heroin dependent mothers and appropriate non-drug-dependent control populations. In using methadone maintenance, it was observed that we could essentially normalize the women's lifestyle so that they could have the opportunity to attend regular prenatal care and counseling sessions. Our primary objective was to decrease the incidence of maternal and fetal complications which have been found during illicit heroin use, as well as the extreme morbidity seen in the many infants who are prematurely born to this patient population.

Neonatal abstinence symptoms including those related to the central and autonomic nervous system such as tremors, high pitched cry, irritability, sneezing, frantic sucking of fist, sweating, nasal stuffiness, fever, generalized convulsions, and those involving the gastrointestinal system such as vomiting and diarrhea have been seen in infants of heroin and methadone dependent mothers in varying degrees. Fortunately, we have developed successful methods which facilitate the assessment and treatment of the syndrome so that abstinence does not seriously threaten the well-being of the infant. This manuscript reports clinical research on infants born to women in a program which utilizes a comprehensive approach of intensive obstetrical and psychosocial care combined with methadone maintenance. These data will shed some light on the controversy concerning the effects of methadone used during pregnancy on neonatal outcome.

Methods and Results

Comparative groups of 488 pregnant women who delivered at Philadelphia General Hospital between 1969 and 1975 were studied. The pregnant women were divided into five groups including 303 women who were either heroin or methadone dependent and 195 women who were not drug-dependent. They were further classified according to the amount of prenatal care. The groups were as follows: 63 patients in Group A were heroin dependent and had no prenatal care; Group B included 88 patients who were enrolled in the Family Center Program, maintained on methadone, and provided with psychosocial counselling and obstetrical care. The average number of prenatal visits in this group was only 1.8. Group C included 152 women who were enrolled in Family Center and maintained on methadone. These women did benefit from extensive obstetrical services as well as psychosocial counselling with an average of 8.3 prenatal visits. There were 85 women in Group D who were non-drug-dependent and who had no prenatal care. Group E included 100 women who were also non-drug-dependent but who came to the same prenatal outpatient clinic at our hospital. Both of these groups delivered at PGH and included women who were of the same socioeconomic and ethnic class as our drug-dependent patients.

The heroin habit and methadone dose and duration in Groups A, B, and C are shown in table 1. Both methadone-treated groups (B and C) had used significantly

more heroin (bags/day) than the patients remaining on heroin throughout pregnancy. However, there is no significant difference in duration of heroin usage among any of the groups. Heroin use and duration in Group A was calculated from initial heroin use to delivery, and in Groups B and C it was calculated from initial use until enrollment in the methadone maintenance clinic. The methadone dose and duration of groups B and C are also compared in this table. While the average daily methadone dose in Groups B and C is not significantly different, Group C patients were receiving methadone significantly longer.

TABLE 1

HEROIN HABIT AND METHADONE DOSE/
DURATION IN GROUPS A, B, AND C
(N = 303)

Philadelphia General Hospital
1969-1975

Group Comparisons	Heroin		Methadone	
	Bags/Day	Duration (Months)	Dose (Mg./Day)	Duration (Weeks)
A (N = 63)	6.1	52.7	N.A.	N.A.
B (N = 88)	10.1	45.4		
	$p < 0.001$	N.S.		
A (N = 63)	6.1	52.7	N.A.	N.A.
C (N = 152)	10.9	46.9		
	$p < 0.001$	N.S.		
B (N = 88)	10.1	45.4	29.5	14.2
C (N = 152)	10.9	46.9	33.3	28.5
	N.S.	N.S.	N.S.	$p < 0.001$

All five groups were compared in regard to obstetrical complications (table 2). Group A, the heroin dependent/no prenatal care group, had the largest percentage of obstetrical complications. Groups B and C were not significantly different from Group E, the non-drug-dependent/prenatal care patients.

TABLE 2

OBSTETRICAL COMPLICATIONS
5-YEAR EXPERIENCE WITH 303 DRUG-DEPENDENT WOMEN AND 185 CONTROLS

Philadelphia General Hospital
1969-1975

Groups	No. of Patients	Average No. of Prenatal Visits	Obstetrical Complications %	LBW Incidence %	Pre-Eclampsia %
A	63	0	33.3	47.6	9.5
B	88	1.8	20.5	34.9	3.4
C	152	8.3	25.0	17.1	5.2
D	85	0	28.2	17.9	8.2
E	100	9.1	23.0	13.0	7.0

There are striking differences in the incidence of low birth weight which is evaluated in all groups, however (infants who weigh less than 2,500 grams or 5 1/2 pounds). The usual incidence of low birth weight in this country is between 8 and 10 percent. In community hospitals in our area where prenatal care is given to a large number of patients, the incidence is between 5 and 6 percent. At PGH, the overall population has a low birth weight incidence between 13 and 18 percent, because our hospital cares for low socioeconomic class patients as well as those women who do not have prenatal care despite the fact that they are not abusing drugs.

The largest percentage of low birth weight infants was in Group A (47.6%), followed by Group B in which there was 34.9 percent. This is three times the national average, and much higher than the general PGH population (Group E). The incidence of low birth weight is markedly decreased in Groups C and D in comparison to Groups A and B, and is no higher than in the control group (E). The complication of preeclampsia which includes the symptom complex of hypertension, swelling, and protein in the urine, is listed in the last column of table 2. Again, Group A has the highest incidence with the two methadone dependent groups having less than the non-drug-dependent groups.

Table 3 lists the birth weights of the 303 infants born to drug-dependent women and the 185 controls. It should be noted that the average weight in grams is much lower in Group A than any of the other groups.

TABLE 3

BIRTH WEIGHTS IN 303 INFANTS OF
DRUG-DEPENDENT WOMEN AND 185 CONTROLS

Philadelphia General Hospital
1969-1975

Groups	Number of Infants	Average Weight in Grams
A	63	2511
B	88	2663
C	152	2900
D	85	3035
E	100	3095

The birth weight, gestational age, and Apgar scores of Groups A, B, and C are presented in table 4. There are no significant differences between the heroin dependent/no prenatal care (Group A) and the methadone dependent/inadequate prenatal care groups (Group B) in regard to birth weight and gestational age. Birth weight and gestational age are significantly higher in the methadone/extensive prenatal care group than in the other two. In comparing Apgar scores at both 1 and 5 minutes in the various groups, the only significant difference is found between Groups A and C.

The incidence of morbidity in infants born to drug-dependent women and controls and other neonatal variables are summarized in table 5. Infants were considered to have morbidity if they had one or more of the following conditions: asphyxia neonatorum, aspiration pneumonia, congenital syphilis, intrauterine growth retardation, prematurity, hyperbilirubinemia, septicemia, hemolytic disease, transient tachnypea, hypocalcemia, hypoglycemia, or hyaline membrane disease. Infants in Groups A and B had the highest percentage of infant morbidity, although those in Group C were also considerably higher than those in Groups D and E. As a consequence, infants in Groups A, B, and C had increased hospital stays in comparison to the control groups. The incidence of withdrawal is noted in the last column in this table. Infants were considered for this category if they had one or more signs of the withdrawal, whether they had to be treated or not.

The incidences of prematurity, low birth weight, and morbidity in the three addicted groups are compared in table 6. Infants were designated as premature if their birth weight was appropriate for gestational age. These infants were all less than 37 weeks of gestation. There are no significant differences between Groups A and B in regard to incidence of prematurity, low birth weight, and morbidity. When comparing Groups A and C, significant differences are seen in the incidence of prematurity and low birth weight but none in regard to morbidity. It should be noted though that the trend in Group C is toward a lower percentage of morbidity in comparison to Group A. Significant differences were found in all parameters when comparing Groups B and C.

TABLE 4

COMPARISONS OF BIRTH WEIGHT, GESTATIONAL AGE, AND APGAR SCORES IN GROUPS A, B, AND C*

Philadelphia General Hospital
1969-1975

Group Comparisons	Birth Weight (Grams)	Gestational Age (Weeks)	Apgar Score 1"	Apgar Score 5"
A (N = 63)	2511	37.4	7.0	8.3
B (N = 88)	2663 N.S.**	37.6 N.S.	7.8 N.S.	8.9 N.S.
A (N = 63)	2511	37.4	7.0	8.3
C (N = 152)	2900 $p < 0.01$	38.9 $p < 0.01$	7.8 $p < 0.04$	9.1 $p < 0.03$
B (N = 88)	2663	37.6	7.8	8.9
C (N = 152)	2900 $p < 0.01$	38.9 $p < 0.06$	7.8 N.S.	9.1 N.S.

* All of the values represent averages for the specific group

** N.S. - Not significant

TABLE 5

INCIDENCE OF MORBIDITY IN 303 INFANTS OF DRUG-DEPENDENT WOMEN IN COMPARISON TO 185 CONTROLS

Philadelphia General Hospital
1969-1975

Groups	Average Prenatal Visits	Baby Days in Hospital	Incidence of Neonatal Morbidity (%)	Total Withdrawal (%)
A (N = 63)	0	26.0	74.6	95.0
B (N = 88)	1.8	18.0	80.2	96.2
C (N = 152)	8.3	16.6	65.8	91.9
D (N = 85)	0	7.3	25.7	0
E (N = 100)	9.1	6.7	27.0	0

TABLE 6

COMPARISONS OF INCIDENCE OF PREMATURITY (AGA < 37 WEEKS), LOW BIRTH WEIGHT (< 2500) AND INFANT MORBIDITY IN GROUPS A, B, AND C

Group Comparisons	Gestational Age	Incidence of Prematurity (%)	Incidence of LBW (%)	Incidence of Morbidity (%)
A (N = 63)	37.4	38.1	47.6	74.6
B (N = 88)	37.6	30.2	34.9	80.2
	N.S.	N.S.	N.S.	N.S.
A (N = 63)	37.4	38.1	47.6	74.6
C (N = 152)	38.9	10.5	17.1	65.8
	$p < 0.01$	$p < 0.001$	$p < 0.001$	N.S.
B (N = 88)	37.6	30.2	34.9	80.2
C (N = 152)	38.9	10.5	17.1	65.8
	$p < 0.06$	$p < 0.001$	$p < 0.01$	$p < 0.03$

Withdrawal symptomatology was evaluated for 287 of the infants of drug-dependent mothers and is summarized in table 7. The infants were divided according to whether the withdrawal was mild, moderate, or severe. Mild withdrawal was that which did not necessitate pharmacotherapy. In moderate withdrawal, pharmacotherapy was needed for 14 days or less, while in severe withdrawal it was necessary for more than 14 days. Over 80 percent of the infants in Groups B and C, the methadone dependent mothers' infants, had withdrawal which was mild or moderate in comparison to 70 percent of infants in Group A. Severe withdrawal was seen in 25 percent of the infants of heroin dependent mothers in comparison to 11 percent in both methadone dependent groups.

Summary

In conclusion, when comparing a group of infants born to heroin dependent women and two groups of methadone maintained women, one with inadequate and the other with adequate prenatal care, striking differences are found. Both groups of methadone maintained women in comparison to the heroin dependent

women had *decreased* obstetrical complications including preeclampsia, a decreased incidence of low birth weight and prematurity and an increased average birth weight, gestational age, and Apgar scores. There were no significant differences between overall infant morbidity, but withdrawal severity was greater in the infants born in the heroin dependent group than those in either methadone dependent group.

When comparing the two methadone dependent groups, the incidence of low birth weight, prematurity, and morbidity was greater in the group receiving inadequate prenatal care. Even though obstetrical complications were seen less in the methadone dependent/inadequate prenatal care group, average birth weights were decreased in comparison to the methadone dependent/adequate prenatal care group. There were no significant differences in Apgar scores and withdrawal severity between the methadone dependent groups. It appears, then, that short term methadone maintenance and inadequate prenatal care do not significantly improve infant outcome, but longer methadone maintenance during pregnancy with adequate prenatal care can significantly improve infant outcome in regard to the parameters listed above.

TABLE 7

WITHDRAWAL SYMPTOMATOLOGY IN 287 INFANTS
OF DRUG-DEPENDENT MOTHERS

Philadelphia General Hospital
1969-1975

Groups	No Withdrawal (%)	Mild Withdrawal (%)	Moderate Withdrawal (%)	Severe Withdrawal (%)	Total Withdrawal (%)
A (N = 60)	5.0	36.7	33.3	25.0	95.0
B (N = 79)	3.8	45.6	39.2	11.4	96.2
C (N = 148)	8.1	27.7	53.4	10.8	91.9

The Role of Qualitative & Quantitative Analysis of Drugs & Their Metabolites in Maternal-Neonatal Studies

Mary Jeanne Kreek, M.D.

I am going to speak on the role of qualitative and quantitative analyses of drugs and their metabolites in maternal-neonatal studies. Whatever our viewpoint, philosophy, or experiences, I think we share these common goals for our patients: cessation of illicit drug use, good prenatal care, a healthy mother and child, and suitable environment for care of the infant.

In relation to these goals, there are many research needs which have developed over recent years. Urgently needed at this time are proper studies of pregnant women abusing or being treated with narcotics during pregnancy, to elucidate the relative roles played by narcotic drugs per se and by polydrug use and abuse, alcohol abuse, smoking, chronic diseases and altered nutritional states on the progress and outcome of pregnancy, and on the clinical status of infants in the perinatal period and in the early years of life.

Such studies could utilize various laboratory analytical techniques including thin layer, gas, and liquid chromatography and mass spectrometry for qualitative analysis of drugs and their metabolites in biologic fluids, along with new techniques of radioimmunoassay, mass fragmentography using reverse isotope dilution methods, and stable isotope tracer techniques for quantitative and kinetic analysis of drug levels and disposition (1,2,3,4,5,6,7). These data could then be related to clinical findings (2).

There are many major medical complications of narcotic addiction during pregnancy. Among them are acute and chronic hepatitis, bacterial endocarditis, glomerulonephritis, tetanus, cellulitis, venereal disease (as well as a high incidence of biologic false positive tests for syphilis), and effects of polydrug and alcohol abuse (8,9,10,11). The risks of these diseases, especially acute infectious diseases, are markedly reduced when the pregnant narcotic addict is admitted to and closely followed in a methadone maintenance treatment program or some alternative successful pharmacological or drug free treatment modality.

There are also many major pharmacological complications which may occur during pregnancy. Other drugs of use and abuse which may frequently alter effects of narcotics include alcohol, diazepam and other tranquilizers, and barbiturates and other sedative-hypnotics. I think we should focus on the problems of drug use and abuse by society as a whole, as well as those of the "street" drug abuser and the patient in methadone maintenance treatment. This will help us avoid the negative pejorative attitudes often expressed by the lay population

and medical profession toward our patients. Therefore, I have selected two drugs commonly used by the general population (including pregnant women), diazepam and barbiturates (Valium and Nembutal, Seconal or phenobarbital), as well as the narcotics themselves, to discuss in terms of their effect on the feto-placental unit.

Morphine, dihydromorphine, and methadone cross the placenta of rats and penetrate the fetal brain more readily than the maternal brain (12,13,14,15). The concentration of these drugs in fetal brains has been found to be 2 to 3 times greater than in the maternal brain. Penetration of the brain by narcotics diminishes with age after birth.

Morphine and methadone cross human placenta and may be identified and measured in amniotic fluid, cord blood, and neonatal urine (2,16). Metabolism of narcotics during pregnancy may be altered by the effects of the hormonal milieu of pregnancy on metabolism of drugs in general (17,18,19). Little is known about the effects of this altered hormonal state on drug metabolism in the adult human female. It is known that estrogens may inhibit microsomal enzyme metabolism of several drugs, including some narcotic drugs, in nonpregnant animals, and that growth hormones may alter the level of cytochrome P-450 and microsomal drug-metabolizing enzyme activities (17,18,19).

What is the role of human placenta and fetal liver in narcotic metabolism *in vivo*, and what are the effects of other drugs, used or abused, on narcotic metabolism during human pregnancy? The answers to these questions are not known at this time.

Some studies on the disposition and effects of other drugs, including diazepam and barbiturates, on the maternal-fetal unit have been carried out in human females and their offspring. The distribution and effects of diazepam in the maternal-fetal unit and the neonate have been studied in women who were neither dependent upon narcotics nor abusing other drugs (20,21,22,23,24,25,26). Indications for diazepam use in pregnancy include use as a tranquilizer, for management of threatened abortion, and for treatment of preeclampsia or eclampsia. Diazepam has also been used as a relaxant during active labor and delivery. Pharmacologic findings have indicated that diazepam transfers across the placenta both in early and late pregnancy and that it accumulated in fetal tissues in high concentrations. Another finding is that after chronic low to medium dose treatment in the pregnant mother, concentrations of diazepam and its active metabolites in the infant's plasma are high enough for pharmacologic action for at least eight to ten days after birth (20,24). The acute administration of diazepam during labor and delivery in total amounts exceeding 30 mg. during the 15 hours just before delivery may also result in prolonged pharmacologically active concentrations and clinical action in the neonate (20). However, acute doses less than these amounts during labor had no significant adverse effect on the infant's clinical state.

Similarly, studies of effects of barbiturates in the human maternal-fetal unit and neonate have shown that infants born of mothers receiving chronic barbiturate treatment have perinatal symptoms of withdrawal, tremulousness, restlessness, hyperreflexia, irritability, sleeplessness, persistent high-pitched

cry, and occasionally convulsions (27,28). In some instances, symptoms appeared at birth; in others, not until 4 to 7 days after birth. Symptoms persisted in some infants for several weeks and in some cases up until age 6 months. Withdrawal symptoms were observed in some infants born to mothers taking doses as low as 90-100 mg. of phenobarbital daily before delivery for management of seizures or other disorders.

I find it a point of great interest and tragedy that none of these kinds of careful studies has been carried out in pregnant women maintained on methadone or in other treatment for heroin addiction and their offspring. Such studies including close monitoring by history, physical examination, and analytical laboratory techniques for multiple drugs of use and abuse are critically needed at this time. This is an urgent reason for all of us to begin talking and working together.

Methadone itself is widely distributed throughout the body after oral ingestion, so that less than 6 percent is in the total blood volume at the time of peak plasma levels (10,29). There is extensive nonspecific tissue binding of methadone creating nonspecific reservoirs which can release unchanged methadone back into the blood stream, contributing to its long duration of action (30). Recently, analytical techniques have been developed to measure amounts of methadone and its metabolites in feces, amniotic fluid, and breast milk, as well as in plasma and urine (2,7,29,31).

After ingestion of methadone by adult maintenance patients with no polydrug use, the peak plasma levels occur between 2 and 6 hours after the oral dose, and plasma concentrations of methadone at that time rarely exceed one microgram per milliliter (29). Lower but sustained concentrations are present during the remainder of a 24-hour period between doses.

Now I will briefly discuss a patient for whom we had the opportunity to perform some laboratory analyses (2). She was treated in a methadone program in another city. She was maintained throughout much of her pregnancy on 110 mg. of methadone a day. Then a decision was made by her clinic staff to rapidly detoxify her 37 days prior to delivery. Her methadone dose was dropped precipitously from 110 mg. to 9 mg. in 37 days. While still on 110 mg. per day of methadone, this patient exhibited plasma levels of methadone which were somewhat lower than what one would expect to see in a nonpregnant patient receiving this dose, which probably suggests an increased volume of distribution during pregnancy. At delivery, when the patient was receiving only 9 mg. of methadone each day, the amniotic fluid concentration of methadone was 0.66 μg/ml., which is approximately the concentration seen at time of peak plasma levels in a patient maintained on 100 mg. of methadone a day. Neonatal urine had a methadone concentration of 2.2 μg/ml. This is a concentration similar to that which might be observed in an adult patient receiving 30-50 mg. of methadone per day. The pyrrolidine metabolite was found in both amniotic fluid and neonatal urine. The pyrrolidine either passed from the maternal circulation into the fetal-placental unit, or methadone was metabolized in the placenta and/or fetal liver to the pyrrolidine metabolite, or both.

In the postpartum period, the methadone dose of this patient was raised to 50 mg. a day. Breast milk concentrations of methadone varied from about one-

tenth up to about one-half of the plasma levels at various time points studied. Peak concentrations in breast milk were observed 1 to 2 hours after peak concentrations in plasma. The concentrations of methadone in plasma were extremely low, and therefore the concentrations in breast milk were also extremely low. If one calculates the daily amount of methadone which could be transferred in breast milk to the infant based on the number of milliliters of milk consumed per day, one finds that in this case less than 0.2 mg. of methadone would be ingested per 24-hour period. Thus, if only microgram amounts of methadone per day could be delivered to the child by milk in a patient receiving 50 mg. per day of methadone, one should question the usual recommendations to methadone maintenance patients not to nurse their babies. This nursing may be an important part of mothering, which is needed by most of these patients.

In this one-patient study, I would also like to point out that, although I never saw or interviewed this patient, we were able to find out by laboratory analyses that this mother was using barbiturates in the immediate prepartum period, possibly to self-treat narcotic withdrawal symptoms which may have resulted from the extremely rapid methadone dose reductions. Therefore, the signs and symptoms which developed in the baby in the postpartum period may have come from barbiturates, and not from methadone alone.

I believe that history taking, physical examinations, counseling discussions, and routine urine monitoring should be carried out in all pregnant mothers who are narcotic addicts and who are in treatment for addiction, and in their babies. I also believe that until we have performed and analyzed more thorough studies, which have been well planned and executed, we should avoid, whenever possible, the prescribing of multiple drugs to pregnant women. Thus, in the case of methadone maintenance patients, diazepam, barbiturates, and similar agents should not be added to the therapeutic regimen unless they are absolutely essential, until we have more information about possible drug interactions with methadone and the combined effects in the fetus and neonate. Whenever a detoxification from street narcotics or a dose reduction of methadone is carried out during pregnancy, this should be done with great care and caution. It should always be remembered that narcotic withdrawal symptoms may be prevented or treated satisfactorily only with a narcotic, not with a sedative or tranquilizer. Also, it should be remembered that if a patient is not receiving adequate medical care, including necessary pharmacological management of addiction, she will return to the streets to seek her own solutions to the problem.

We must extend our research to answer the many unanswered questions. We must, in the interim, apply our available information with good judgment to assure the best possible outcome for pregnant women and their offspring.

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Management of Pediatric Medical Problems in the Addicted Household

Geraldine Wilson, M.D.

As a pediatrician involved in the comprehensive care of high-risk babies at the city-county hospital in Houston, I have observed the growth and development of narcotic addicts' infants for the past 10 years. At Baylor we have been concerned that narcotic-affected infants, even when raised in a stable environment, have behavioral, neurologic, and growth characteristics different than those of other high-risk babies (1).

This morning I shall first give the background of our program, and then will outline some of the parenting problems we have encountered and are currently encountering in our drug abusing families.

Background

We were funded 2 years ago to study the pregnancy, postnatal course, and subsequent growth and development of infants of heroin addicts, methadone-maintained women, and matched controls. We are defining residual problems in children of addicts and investigating the causal role of heroin or methadone use and other prenatal variables. Forty percent of our patients are white; 40 percent Chicano; and 20 percent are black.

Our staff consists of a pediatrician, obstetrical and psychiatric consultants, a research nurse, psychologist, and social workers. We seek referral of addicts early in pregnancy and focus on providing optimal prenatal care through medical services, nutritional counseling, social services, and management of addiction.

We do not administer methadone or offer ongoing psychiatric care. Patients are referred to other facilities for treatment of addiction. Thus, a major role of project personnel is to maintain contact with patients to assure prescribed data collection.

Care During Pregnancy

Although services available to the pregnant addict in our area have improved during the past two years, several trends in the community have interfered with the anticipated improvement in outcome of the addicts' pregnancy. These

include: a) reluctance of many heroin addicts to participate in methadone programs; b) inconsistent treatment policies of local methadone programs, perhaps related to conflicting reports concerning the effects of methadone on pregnancy; and, c) extensive polydrug use by the majority of methadone-maintained mothers. During the first few years of methadone treatment programs in our community, we found dramatic differences between the lifestyle and medical compliance of women treated with methadone and those using heroin. These differences have become progressively more obscure, and among the addict population, entrance into a methadone program may no longer be the hopeful goal it was a few years ago.

Infant Care

Following delivery of the infant, focus shifts to the care of the sick or withdrawing baby and support of the family. We encourage daily contact and parental participation in care of the infant during his hospitalization.

Most addicted mothers are hesitant to touch their tremulous baby, but, under nursing supervision, learn to handle the infant properly. Others deny the obvious signs of withdrawal and accuse medical staff of addicting the baby through administration of drugs. Failure to visit the baby may indicate lack of interest, but most often represents the mother's inability to face the baby's misery, for which she feels responsible.

In our program, babies remain in the nursery until they are gaining weight consistently, feeding well, and sleeping for at least two hours without medication, an average time of 21 days. Those mothers who have not visited the baby frequently seem to be relieved when the infant is discharged, tend to report entirely normal behavior on the part of the infant, and are very difficult to engage in followup care. It appears that they have never accepted the reality of their infant's condition and seek to deny the existence of problems, past, present, or future.

The dilemma of "what to do" when the baby is discharged is an ongoing problem. Those parents who become involved with their baby and hospital staff during hospitalization are generally able to care for the infant and seek assistance when problems arise at home. Less involved mothers, particularly those who continue heroin use, often provide no evidence of being fit mothers except their insistent desire to raise their baby.

If an infant is abandoned in the nursery, protective measures are taken. However, protective measures would seem to be indicated in all cases where there is a serious question of the mother's ability to provide care. The staff faces a double dilemma when involving child welfare agencies in an anticipatory role, however, for this often alienates the family and further removes the child from needed care.

We have found that most families caring for the recovering infant avail themselves of medical advice and support during the baby's first weeks at home. Even in the best of environments, symptoms of subacute withdrawal occur after

discharge in most cases (2). Restlessness, periods of irritability, spitting up, and need for frequent feedings necessitate constant attention.

Of great concern is potential disturbance of the relationship between mother and infant. Synchronous behavior between a mother-baby pair normally develops early, but may be hampered in this relationship by the mother's inability to respond sensitively to the infant, as well as by the infant's early unresponsiveness. A disorganized system of communication thus develops. This becomes particularly important in light of our recent study showing disorganized behavior in preschool children exposed to heroin during pregnancy, even when the children were raised in a stable environment (3).

Thus, the potential for behavioral disorders, emotional problems, and learning disabilities is tremendous when the combination of organic factors and disturbed mother-child relationship are considered.

Medical Aspects

The first 3 to 4 months of the infant's life at home may be fraught with problems. Babies develop symptoms (diarrhea, vomiting, colic, irritability) and mothers complain. But how ill is the baby really? To what extent does the mother's anxiety and disorganized behavior contribute to the baby's problem? How often does her report of irritability reflect her own distress rather than the infant's?

It is extremely difficult to interpret the infant's condition because many addict mothers seem unable to report behavior objectively. Nor can they adhere to recommended changes in diet or schedule. We frequently resort to hospitalization or temporary foster care to accurately assess the severity of the infant's problem.

Equally distressing is the fact that serious illness may mimic subacute withdrawal and diagnosis may be delayed because symptoms appear to be part of the spectrum of withdrawal. Congenital cytomegalovirus infection, hepatitis, urinary tract infection, and meningitis have been identified in infants with persistent irritability, feeding problems, or failure to thrive at 3 to 6 months of age.

The treatment of illness in addicts' infants presents still other problems. Medical care is "crisis-oriented," and followup appointments are rarely kept. We find that most of the families do not administer medication responsibly. They tend to administer it only until the infant "feels good" rather than completing a course of therapy.

Because the parents are often unable to provide adequate care, we may feel it necessary to intervene in order to protect the child from neglect or abuse. But we must face and answer the questions "When should child protection agencies be involved?," and "In what way can they be a positive force rather than a negative one which alienates the mother from supportive programs?"

Summary

In reviewing parenting and child-rearing behavior of 45 addicts in our research group, I have found the following pattern. Women who are, first, reasonably well controlled on methadone and, second, have a relatively stable relationship with the baby's father are more likely to take advantage of prenatal care, to become actively involved with their newborn infant, and to seek attention for his medical problems. They are less likely to utilize other caretakers except during limited periods of crisis. Even these families, however, require intensive support which must continue after the mother assumes responsibility for the child's care. One or two hours of instruction in child care is totally inadequate. Instructions and demonstrations must be repeated again and again before mothers are comfortable with them.

It seems clear, then, that highly active measures are necessary to begin to effect successful parenting by the drug-abusing family. Prolonged and intensive contact with trained professionals in a day-care type setting, emphasizing the mother's role in care, seems ideal. Sessions would continue until a mother demonstrated both proficiency in child care technique and the ability to respond to her infant. Child protective services may be necessary for all families failing to meet the requirements of this type of program.

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Developmental Findings With Infants Born to Mothers on Methadone Maintenance: A Preliminary Report

Ann Lodge, Ph.D.

The development of babies born to mothers in the pregnant addict methadone program has been studied over a period of 4 years by the Infant Development Research Laboratory, using both behavioral and electrophysiological measures. During the neonatal period, the infants were examined using the Brazelton Neonatal Behavioral Assessment Scale. This scale rates the baby's responsiveness in a number of areas, with special emphasis upon quality of sleep and arousal, capacity to handle both internal and external stimuli, responsiveness to people, and a detailed evaluation of sensorimotor status. The Bayley Scales of Infant Mental and Motor Development were also given during the first month, at 3-month intervals thereafter during the first year, and at 6-month intervals during the second and third years. With older infants, the Minnesota Child Development Inventory and the Stanford-Binet Intelligence Scale were added to the test battery. The Peabody Picture Vocabulary Test, which also yields an intelligence quotient, was used with both mothers and older children. Auditory evoked EEG potentials to a click stimulus and visually evoked potentials to light and checkerboard pattern stimuli have also been investigated at these same test intervals (Lodge, Marcus, and Ramer 1975).

Thus far, 45 infants have been examined, with the study of 24 having commenced during the neonatal period and continued on a longitudinal basis. Since approximately one-half of the sample have been examined between the ages of 1 and 4 years, the present findings, based upon a combination of cross-sectional and longitudinal data, are necessarily preliminary and inconclusive. Developmental findings obtained with sibling controls as well as with a group of infants whose mothers used heroin prenatally are omitted from this report (see Ramer and Lodge 1975).

During the neonatal period the methadone babies received a mean Mental Development Index (MDI) on the Bayley of 95, or within the average range, while their mean Psychomotor Development Index (PDI) was 125, or above average. Despite their frequently exaggerated reflexes and some signs suggestive of motor precocity in many of the infants, such as in head control, hand-mouth coordination, and crawling movements, individual item analysis indicated that the newborn addicted infants differed significantly from normal controls on only one item from the motor portion of the test: a greater degree of fistedness. The Brazelton Scale findings, however, indicate that the methadone babies were rated significantly higher than the normals on tonus, activity level and hand-mouth facility, and also displayed more irritability. The addicted infants

were also rated as showing higher levels of behavioral arousal, more lability, and more rapid buildup to an aroused state than did normal controls. On the Mental Scale, addicted infants displayed a somewhat different pattern of performance from nonaddicted controls in certain areas of behavior despite the comparability of their overall test scores. While these trends did not always reach statistical significance, the pattern of performance of addicted infants appeared in general to be characterized by an unusually high degree of auditory responsiveness and orientation, below average visual following and exploration, more vocalization, and a greater degree of manipulation and especially mouthing of objects and fingering hands together, as compared with nonaddicted controls. Individual item analysis (using the Fisher exact probability test) revealed that addicted infants displayed significantly less horizontal eye coordination in response to a light stimulus ($p = .05$; two-tailed test) and significantly less vertical eye coordination ($p = .05$; two-tailed test) in response to the red ring, when compared with normal controls.

The somewhat lowered scores of the neonatal methadone group on the "mental" portion of the Bayley Scale seemed largely based on poor attentiveness to visual stimuli and lack of sustained visual following. On the Brazelton, methadone infants were rated as showing less alertness than normals and significantly depressed babies displayed many apparently normal behavioral responses (including orientation and habituation) to auditory stimulation. Their responsiveness to voice, expressed by orienting and quieting behavior, has important implications for handling. Their hand-mouth facility provides some capacity to gratify their pronounced sucking needs. These neonatal behavioral findings, including a difference between visual as compared with auditory orientation, appear consistent in several respects with results reported by other investigators (Davis 1974; Lessen-Firestone et al. 1974; Soule et al. 1973).

Auditory and visual evoked potentials as well as resting EEG activity obtained from passively addicted neonates during the early stages of withdrawal were characterized by abnormal rippling which appeared to indicate cns irritability. Latencies of evoked potential components obtained were similar for both addicted and normal controls; however, there was some tendency for the addicted infants to manifest enhanced, short latency, early components. Analyses of the neonatal findings have been reported (Lodge, Marcus, and Ramer 1975), while the electrophysiological data obtained at later ages are currently being examined.

The neonatal evoked potential findings seemed to corroborate the behavioral picture in suggesting a differential responsiveness to auditory as compared with visual stimulation in the methadone addicted neonates. Analysis of EEG frequencies obtained in response to stimulation indicated that visual stimuli had little arousal value for these infants, at least during the withdrawal period. Their auditory evoked responses, on the other hand, were quite pronounced. Possible hypersensitivity to auditory stimulation may indicate a need for protection in this area. A recent study with morphine-sensitized baby mice indicated that neonatal exposure to a loud stimulus such as a doorbell predisposed them to subsequent audiogenic seizures (Slotkin 1974).

Neonatal visual deficits have been associated with other conditions where infants are potentially at risk for central nervous system damage. If there is a critical early period for patterned visual input, as the animal work of Hubel and Wiesel (1963) suggests, then even temporary disruption of visual responsiveness during the neonatal withdrawal period could conceivably create a basis for longer range perceptual deficits. At this point, however, the possible long range developmental significance of these findings is not yet clear.

Schulman (1969) found an unusually high percentage of REM sleep to characterize heroin-addicted neonates. A number of our mothers have reported continued irritability, excitability, inability to nap, and various sleep irregularities in their babies. The characteristics of state regulation and environmental conditions which may aid in achieving appropriate organization of electrophysiological and behavioral cycles appear extremely important for this group.

Table 1 illustrates the mean mental and motor developmental quotients found using the Bayley Scales at different age intervals. The overall motor development of the methadone infants appears to progress rapidly during the second and third month. By 6 months of age, there appears to be some leveling off of this rapid rate of sensorimotor development and subsequent developmental test scores appear to stabilize within the average range. The Bayley Mental Scale results appear generally indicative of rapid developmental gains during the second and third months, after initial withdrawal symptoms have subsided and visual alertness has improved, with a mean Mental Development Index (MDI) of 121, or slightly above average, during this period. For the group as a whole, the average MDI has remained in the high average range during the first year and approaches closer to average (96) by year 2. Stanford-Binet test results for those children examined between the ages of 3 and 5 years continue within the normal range with a mean IQ of 94.

The toddlers as a group were found to be highly energetic, active, talkative, and quite reactive to sensory stimulation, and these characteristics may combine to make distractibility a problem. While they appeared interested in toys and objects as well as people, their overall persistence, goal-directedness, and attention span tended to be rather brief. Patterns of object play frequently appeared immature, characterized more by mouthing and banging than by more complex manipulations and constructive play. The mouthing may continue to mirror the strong oral needs that characterized their earliest infancy and frequently interfered with more differentiated manual exploration. While gross motor skills were generally well developed, fine motor skills often appeared relatively less adequate and may contribute to lowered perceptual-motor ability. Such activities as scribbling with crayons and completing form boards, pegboards, and similar puzzles were generally not performed adeptly by the older infants. Since some of these characteristics have been found associated with the quality of early environmental stimulation, it becomes difficult to assess the possible role of the addiction experience in the developmental pattern of these infants.

Nevertheless, in the language realm, which is perhaps the area most importantly related to subsequent intellectual development, this group of infants displayed

TABLE 1

MEAN BAYLEY INFANT SCALE MENTAL AND MOTOR INDICES
OF INFANTS BORN TO MOTHERS ON METHADONE MAINTENANCE

Monthly Age Interval	Mental (MDI)		Motor (PDI)	
1 month	x	95.32*	x	124.84*
(1-45 days)	S.D.	17.55	S.D.	22.04
N = 25	R	73-135	R	81-177
2-3 months	x	120.91	x	127.18
(46-113 days)	S.D.	12.26	S.D.	9.53
N = 11	R	100-140	R	115-143
4-6 months	x	113.70	x	112.70
(114-195 days)	S.D.	18.92	S.D.	17.38
N = 10	R	92-144	R	92-147
7-9 months	x	117.67	x	103.07
(196-285 days)	S.D.	25.31	S.D.	22.31
N = 15	R	57-140	R	63-140
1 year	x	111.43	x	111.29
(10-15 months)	S.D.	9.40	S.D.	12.38
N = 14	R	93-128	R	90-125
1½ years	x	103.25	x	112.50
(16-21 months)	S.D.	12.23	S.D.	14.29
N = 4	R	88-115	R	100-133
2 years	x	95.50	x	109.00
(22-30 months)	S.D.	15.49	S.D.	17.70
N = 6	R	80-116	R	87-126

* Scores for the one-month age group are derived according to the method described by Bayley (1969, p. 22) using the NIH norms based on the 1958-60 version of the scales.

relative strength, a finding which is rarely associated with environmental handicap. In addition to simply being talkative, they could name many pictures and objects, often at an above-average level, and frequently learned to combine words at an early age (before 2). It is interesting to speculate as to whether their early pattern of neonatal characteristics is related to their subsequent developmental pattern. It is also important to consider intelligence levels of parents as an important genetic factor. Results based on the Peabody Picture Vocabulary Test reveal a mean IQ of 101, or average, for mothers and a distribution of scores which ranges from 75 to 134 and suggests a possible tendency toward a bimodal distribution.

While the developmental test data do not yet permit generalization, they do suggest that infants born to mothers who received methadone during pregnancy may possess a unique pattern and rate of development in various areas. It has not yet been possible to assess the relative impact of genetic, prenatal, and subsequent environmental factors upon the overall developmental picture. The significance of early sleep patterns, sensory responsiveness, and overall regulation of state requires further study. The role of mother-infant interaction and other environmental factors in ameliorating or exacerbating withdrawal also deserves more attention (Davis 1974; Ostrea et al. 1975). It should also be remembered that developmental quotients during these early years, while useful in identifying areas of strength and weakness, are not predictive of subsequent intelligence quotients. These issues might be further clarified through systematic research, perhaps carried out within the context of a supportive parent-infant treatment and education program. By attempting to provide optimal conditions for normalizing development, it might be possible to identify long term effects of prenatal drug exposure and to differentiate short term withdrawal symptoms from more sustained developmental influences. In any case, the present results lend encouragement to the possibility that the provision of a modified methadone maintenance program which includes good prenatal care and nutrition, neonatal care, and continued psychosocial support and encouragement to the mother after the birth of the child, including child development information and counseling, may offset the detrimental effects of the neonatal withdrawal experience for the infant and greatly facilitate normal development.

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Neonatal Narcotic Withdrawal Index: A Quantitative Method for Evaluation of Narcotic Abstinence in the Newborn

Marvin Green, M.D.

This presentation was based upon the following paper by Marvin Green, M.D., and Judith Zarin-Ackerman, Ph.D., titled, "Neonatal Narcotic Withdrawal: A Quantitative Index for Evaluation of the Disorder."

Introduction

A number of investigators have explored the use of methods of scoring severity of the narcotic abstinence syndrome in newborn infants (1,2,3,4). Such efforts have been motivated by the desire to shed light on the clinical course of the disorder and to assess the effect of different pharmaceutical compounds on the withdrawal state. Finnegan et al. (3) have observed that application of their score has increased clinical sensitivity and has been useful in correlative studies involving drug treatment and nutritive sucking behavior, while Ostrea et al. (4) have used a withdrawal score to help evaluate the effect of maternal dosage of methadone on severity of illness. It is apparent that a variety of potentially fruitful investigations of the immediate neonatal and long term outcome of prenatal exposure to narcotics are conceivable, provided a suitable instrument is available to measure the intensity of narcotic withdrawal in the neonate.

Requirements for a competent scoring system should include:

1) an adequate number of components to provide a description of the syndrome;

2) not so many components as to make it cumbersome for clinical application by nursery personnel;

3) precise terminology permitting gradation of severity and reproducibility of scores by separate examiners.

It is important to be aware that no instrument exists that specifically permits identification of withdrawal unless narcotic intake during pregnancy can be confirmed and other neonatal illnesses can be excluded in differential diagnosis.

We have devised an instrument, which has been designated as the Neonatal Narcotic Withdrawal Index for the evaluation of the narcotic abstinence syndrome. It is believed that this instrument satisfies the requisites desirable for measuring intensity of narcotic withdrawal in newborn infants.

Materials and Methods

Subjects were 32 newly born infants of pregnant addicts enrolled in the Comprehensive Health Care Program for Pregnant Addicts and Addicted Mothers at New York Medical College and 11 drug free control neonates who were full-size and born at term. Seven (21%) of the drug exposed babies were born before the 37th completed week of gestation* and five (16%) were low birth weight as well. Subjects and controls had 5 minute Apgar scores ≤ 8. Gravidas received regular prenatal care, at least for the last trimester of gestation and were administered prescribed methadone in daily dosages of up to 65 mg. Urine specimens were obtained at intervals during the course of pregnancy and were examined for the presence of other psychoactive drugs by thin layer chromatography. All infants, except one narcotic exposed baby, were delivered vaginally and all were cared for in the same hospital nurseries in which babies of non-drug-using mothers were kept. No attempt was made to limit ambient noise or light for the management of neonates who showed withdrawal. It was our intent to evaluate our withdrawal index in this common setting, both for the purpose of later comparative evaluation on healthy controls as well as for the purpose of encouraging clinical application of the index by the house staff. Initial management of anticipated neonatal withdrawal consisted of frequent feeding at 3-hour intervals and swaddling. Subsequent pharmacological treatment was instituted if a critical level of severity was obtained. Evaluations were carried out on neonates in bassinets, providing withdrawal was not so intense as to require management in incubators. All measurements of narcotic withdrawal scores were performed with infants dressed in diapers only.

In figure 1 we present the Neonatal Narcotic Index. This Index is a device which permits evaluation of narcotic withdrawal by means of numerical score. It incorporates seven elements: Crying, Tremors, Muscle Tone, Respiratory Rate, Axillary Temperature, Vomiting, and Other Signs. Virtually all of the clinical signs of neonatal withdrawal reported in the large series by Zelson et al. (6) form the basis for the seven components of the score. Disturbances in the first six areas comprise more commonly observed manifestations of illness, while those included in the heterogeneous category "Other Signs" represent less frequently encountered findings, except for sneezing (6). Frequency of occurrence is the chief rationale for organization of the components of the score. Subscores of 0, 1, or 2 are given for each of these components. Subscores of 0 and 1 have adverse connotations, while subscores of 2 are defined

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* Where the last menstrual period of the mother was not known or was obviously erroneous, gestational age was determined by the method of Dubowitz et al. (5).

FIGURE 1

NEONATAL NARCOTIC WITHDRAWAL INDEX

INFANT'S NAME (PRINT) _____ CHART # _____

EXAM: DATE _____ HOUR _____ AM PM EXAMINER (PRINT) _____

PRECHTL STATE (PRE.) 1 2 3 4 5 6 | PRECHTL STATE (UNDR.) 1 2 3 4 5 6

ITEM	0	1	2	SCORE
CRYING	≥ 5 MIN. ∑ HANDLING	< 5 MIN. ∑ HANDLING	NO CRYING ∑ HANDLING	
TREMORS	≥ 5 MIN. ∑ HANDLING	< 5 MIN. ∑ HANDLING	NO TREM. ∑ HANDLING	
MUSCLE TONE	TRACTION: PULL TO STANDING	TRACTION: PULL TO SITTING	HEAD LAG	
RESPIRATORY	> 80	61 – 80	< 61	
AXILLARY TEMP. (HIGHEST T. IN PAST 24 HRS.)	> 100	99.1 – 100	≤ 99	
VOMITING	> 2/24 HRS	2/24 HRS	0 OR 1/24 HRS.	
OTHER (OBS./REP., PAST 24 HRS.) (CIRCLE ITEMS)	SNZ. DIAR. SWEAT SKIN ABR. GEN. SZ LOC. SZ. POOR SUCK. SALIV. YAWN. STUFFY NOSE HIC WT. LOSS TERM: > 10%, PREM.: > 15 %			
	5 AND OVER	2 – 4	0, 1	

(POST-SUCKING) 2 MINUTES TOTAL

ITEM	0	1	2	SCORE
CRYING	≥ 5 MIN. ∑ HANDLING	< 5 MIN. ∑ HANDLING	NO CRYING ∑ HANDLING	
TREMORS	≥ 5 MIN. ∑ HANDLING	< 5 MIN. ∑ HANDLING	NO TREM. ∑ HANDLING	
MUSCLE TONE	TRACTION: PULL TO STANDING	TRACTION: PULL TO SITTING	HEAD LAG	
RESPIRATORY	> 80	61 – 80	< 61	
			TOTAL (INC.: T, V, "O")	

MEDICAL TREATMENT STARTED, CHANGED, STOPPED SINCE LAST EVALUATION (SPECIFY MEDICATION, DOSAGE, TIME OF FIRST DOSE, LAST DOSE, CHANGED MEDICATION, OR CHANGED DOSAGE:)

Prechtl States - these are states of arousal (see Table 1)

Other (Obs/Re, Past 24 hrs.) — Observed and/or reported findings obtained during appraisal by the examiner in addition to perusal of nurse's notes.

Post-Sucking 2 minutes — Post-sucking score is performed to permit measurement of respiratory rate. It is performed only if measurement cannot be counted because of crying.

Total (Inc.: T,V,O)

T = Temperature

V = Vomiting

O = Other

FIGURE 1 (Cont'd.)

Specifications for Neonatal Narcotic Withdrawal Index

Crying

Score 0 - Continuous crying for ≥five minutes without handling.
Score 1 - Intermittent or continuous crying for <five minutes without handling.
Score 2 - Crying only when handled or no crying.

Tremors of Extremities

Score 0 - Continuous tremors for ≥five minutes without handling.
Score 1 - Tremors for periods <five minutes without handling.
Score 2 - Tremors only when handled or no tremors.

Muscle Tone

Score 0 - Execute traction response. Head maintained in same plane as trunk as child is pulled into standing position.
Score 1 - Execute traction response. Head maintained in plane of trunk or lags as child is pulled to sitting position. If head lags, then elbows must be flexed at angle of less than 90 .
Score 2 - Execute traction response. Head lags behind the plane of trunk as child is pulled into sitting position; in sitting position head may attain the plane of trunk. Elbows flexed to angle of 90 or greater.

Respiratory Rate (count for 1 minute, child not crying)

Score 0 - Rate >80/minute.
Score 1 - Rate 61-80/minute.
Score 2 - Rate up to 60/minute.

Axillary Temperature (any one measurement in prior 24 hours)

Score 0 ->100 F
Score 1 ->99 F - 100 F
Score 2 -≥99 F

Specifications for Neonatal Narcotic Withdrawal Index (continued)

Vomiting

Score 0 - 2 times in 24 hours.
Score 1 - 2 times in 24 hours.
Score 2 - Up to 1 time in 24 hours.

Other Signs*

Score 0 -≥ 5.
Score 1 - 2-4.
Score 3 -<2.

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* Snz. = Sneezing. Diar. = Diarrhea. Sweat. = spontaneous sweating.
Skin abr. - Abrasions. Gen. Sz. = Generalized convulsions**
Loc. Sz. = Localized myoclonic movements. These occur spontaneously without precipitating movement of involved segment of body, while tremors are precipitated by initiating movement of extremity.
Poor Suck. = Unsustained rhythmicity to sucking.
Saliv. = Salivation. Yawn. = Yawning. Stuffy nose.
Hic. = Hiccups. Weight Loss Term>10% Premature >15%

** If generalized convulsions present, treatment given regardless of level of total score.

as favorable. An optimal total score is 14. We have arbitrarily defined the presence of withdrawal with subscores of less than 2 for Tremors and less than 2 in each of at least two other categories; therefore, a total score of 11 or less is required for the presence of withdrawal. We initiate pharmacological treatment of withdrawal with corroborated scores of 9 or less. For infants requiring treatment, we intended to discontinue medication when two consecutive daily scores of 12 or higher had been obtained; however, we have stopped treatment with lower scores without clinical relapse. The specifications are defined in precise terminology that permits graded differentiation of severity as well as to promote reproducibility of scores by independent examiners.

Table 1 presents the various arousal states defined by Prechtl (7). We identify the arousal state of the baby immediately prior to undressing and again within the first few seconds after removal of the infant's shirt. Data on the relationship between states of arousal and withdrawal scores are insufficient to permit evaluation at this time. In most instances performance of a withdrawal score took approximately 10 minutes. When persistent crying necessitated performance of a postsucking measurement*, approximately 15 minutes were required. With only two exceptions, every narcotic-exposed baby was scored at least one time in the first 72 hours and at times as many as six measurements were carried out during this time span. After discharge from the hospital, measurements were carried out on 16 children until one month of age for the purpose of detection of delayed withdrawal (8).

TABLE 1

PRECHTL STATES

State 1. Eyes closed, regular respiration, no movements.

State 2. Eyes closed, irregular respiration, no gross movements.

State 3. Eyes open, no gross movements.

State 4. Eyes open, gross movements.

State 5. Eyes open or closed, crying.

State 6. Other. (Usually eyes closed, gross movements, no crying.)

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* If persistent crying was present, the baby was permitted to take formula for up to two minutes, during which time respiratory rate was measured. The remainder of the score was then completed.

Results

Among the 32 babies exposed to narcotics in utero, withdrawal was identified in 25 (78%). Only four (16%) of these infants required treatment beyond frequent feeding and swaddling. One baby was given intravenous fluids and electrolytes for management of persistent vomiting; the other three were treated with camphorated tincture of opium, U.S.P. (paregoric). Drug treatment was required for no more than 8 days. All infants recovered.

For infants showing scores consistent with the diagnosis of withdrawal, 21 (84%) were identified within the first 3 days; the remaining 4 were diagnosed between 4 days and 15 days. Although withdrawal was often no longer evident as early as 3 days of age, it usually continued until 7 to 10 days of age, and infrequently even beyond this duration. Late withdrawal signs were seen in only one infant.*

Simultaneous scores were performed on nine patients by two separate examiners, for the purpose of determining reproducibility of measurements. All scoring was carried out without communication between examiners until each score was recorded. For 15 paired measurements, there was 80 percent agreement within ± 1. Measurements covered a wide range of scores reflecting neonatal withdrawal of varied severity.

The index was also tested on 11 control infants. All 14 scores were performed within the first 2 days of life. For 9 infants, 11 scores of 12 or higher were obtained (79%). In two babies, scores of 9 and 11, respectively, were obtained. Each of these lower scores conformed to the definition of withdrawal in spite of absence of identified neonatal illness or maternal history of narcotic use.

There was no significant difference between the average prescribed maternal daily dose of methadone during the last trimester for treated and untreated infants. For the few infants who failed to show withdrawal, the prescribed maternal dose tended to be lower.

In figures 2-5 the course of illness for the treated patients is illustrated. These figures appear in the appendix.

Discussion

Although the incidence of neonatal narcotic withdrawal is comparable to other series dealing with prenatal exposure to methadone (2,3,9) it is unusual for treatment to be required in only 16 percent of the patients (3,9) and then for only short duration. Since most of our gravidas were administered an average

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* In one case, withdrawal was evident within the first 24 hours. Though severity did not warrant treatment with medication, this child continued to show signs of withdrawal when last tested at 34 days of age.

daily dose of methadone of less than 40 mg. during the last trimester, it is uncertain whether the apparent lack of severity of neonatal illness is due to the low maternal dosage or whether it is a reflection of the objective indication for treatment that we established with the aid of the Neonatal Narcotic Withdrawal Index.

Further study is needed to ascertain the effects of greater dosage of methadone alone or in combination with other psychoactive drugs on neonatal narcotic withdrawal scores.

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APPENDIX

TO

NEONATAL NARCOTIC WITHDRAWAL INDEX: A QUANTITATIVE METHOD FOR EVALUATION OF NARCOTIC ABSTINENCE IN THE NEWBORN

FIGURE 2

COURSE OF ILLNESS IN TREATED NEONATES

Case 030. Female infant, 37 weeks of gestation weighing 2320 gr. Mother took 5 mgm of prescribed methadone daily and alleged taking an additional 15 mgm illicitly. Vomiting was the predominant sign of withdrawal in the baby. Intravenous fluids and electrolytes were given to prevent dehydration. Methadone was detected in the last urine specimen of the mother, 45 days prior to delivery.

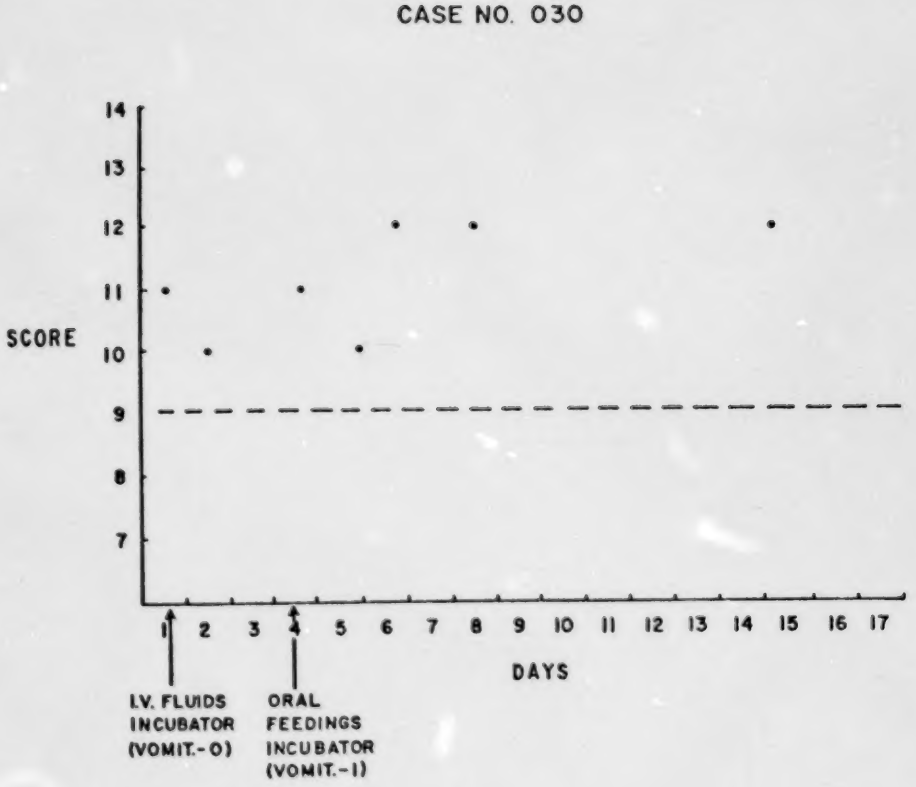


FIGURE 3

COURSE OF ILLNESS IN TREATED NEONATES

Case 050. Male baby born at term and weighing 3200 gm. Mother took 15 mgm of methadone daily. She spontaneously discontinued medication about three weeks prior to delivery. Treatment with paregoric was stopped on day 12; a score of 10 was obtained on day 13. On the following day the score increased to 12, and on day 16 rose to 14.

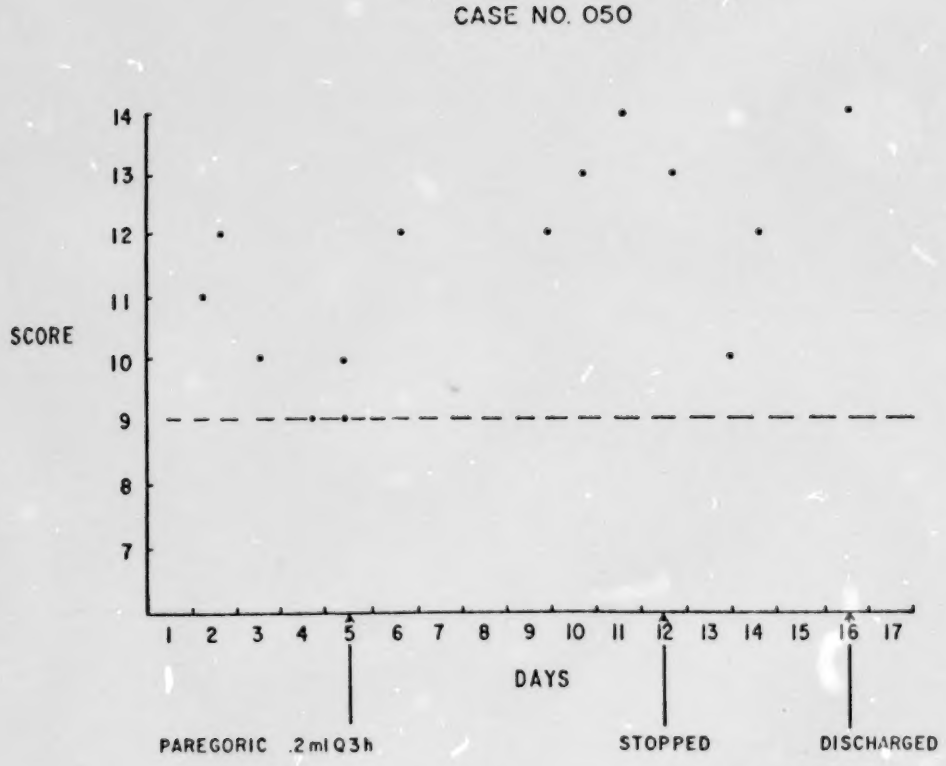


FIGURE 4

COURSE OF ILLNESS IN TREATED NEONATES

Case 001. Female baby born at 36 to 37 weeks of gestation with a weight of 2735 gm. The infant had a cleft soft palate. Her mother took illegal methadone in addition to prescribed medication. The post-partum urine of the mother contained Placidyl and quinine. The urine of the baby contained Placidyl, quinine, methadone and salycilates. Tachypnea was the predominant early sign of withdrawal, actually appearing before other signs of illness. The pH and PCO2 of caillary blood were in the normal range. Treatment with paregoric was stopped on the eighth day in spite of scores of less than 12. There was only a slight relapse.

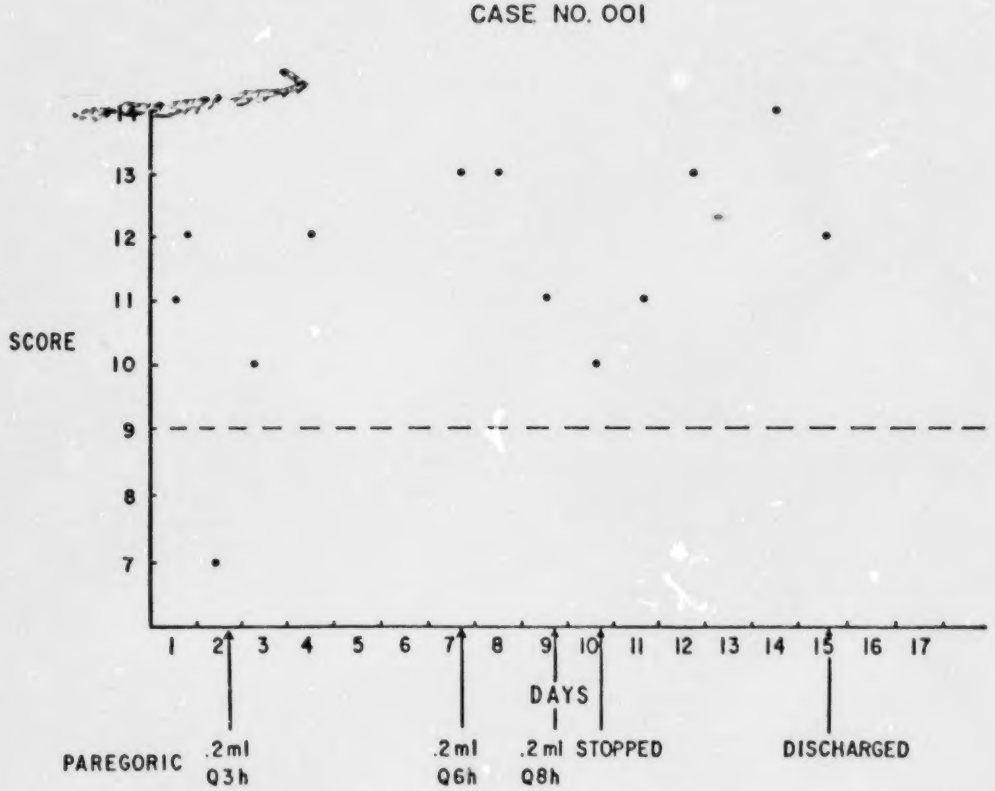
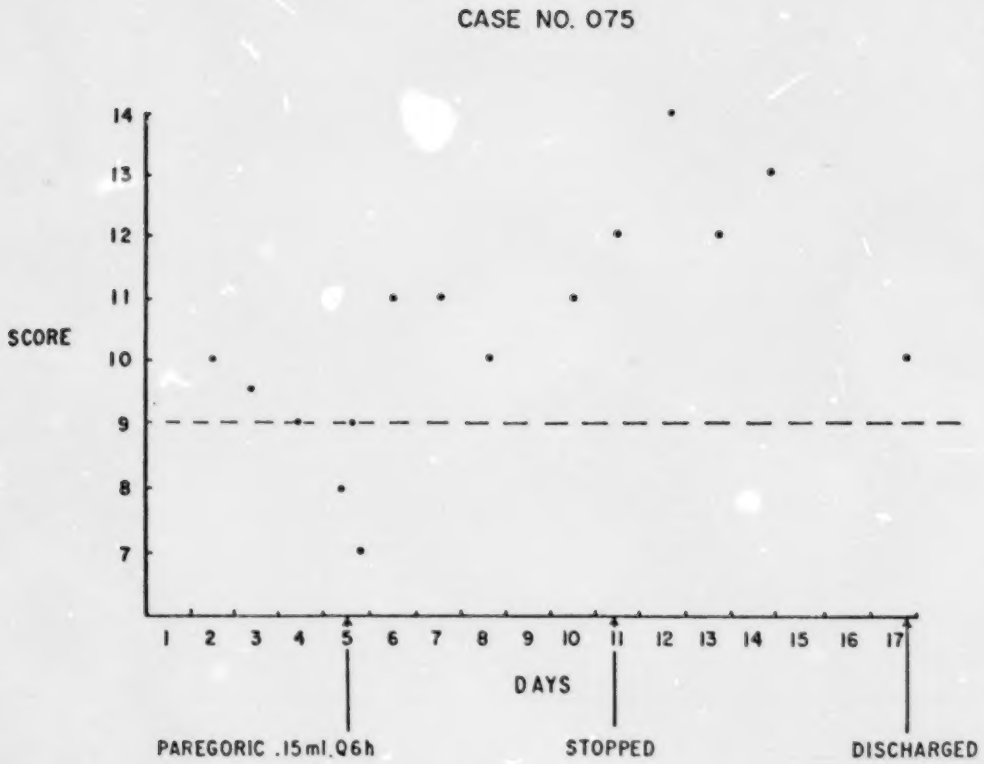


FIGURE 5

COURSE OF ILLNESS IN TREATED NEONATES

Case 075. Male infant born at term weighing 2720 gm. The mother acknowledged taking Valium, Elavil, dilaudid, and cocaine in addition to prescribed and illegal methadone. The urine of the baby contained Placidyl and methadone.



Developmental Assessment of All Infants Born to the Family Care Program, 1975-1976

Judith Zarin-Ackerman, Ph.D.

Introduction

Within the last ten years, advancing medical technology in areas such as safe abortion techniques, amniocentisis and genetic counseling, and safe and expert management of low birth weight infants has produced a significant decrease in the number of newborns formerly categorized as "at risk" for mental and motor growth deficits. However, within this same time frame and contrary to this general trend, one group of risk infants has substantially increased in number rather than decreased. This group is the narcotic-exposed, passively addicted newborn.

Because more women are using drugs than ever before (1), and because 80 to 85 percent of addicted women are in the childbearing age range (approximately 14 to 40 years of age) (2), an ever-increasing number of narcotic-exposed infants are being delivered in hospitals across the country. In response to this increase, health professionals are currently making efforts to find new and more effective methods of objectively assessing and clinically treating this population. For example, a number of investigators have created objective scoring instruments which can be used at time of delivery for rapid and reliable assessment of the narcotic abstinence syndrome (3,4). Such instruments have been found to be helpful in assessing the effect of different pharmaceutical compounds on the withdrawal state and the effect of maternal drug dosage on severity of illness. In addition, clinical programs which include counseling and regular prenatal care have been established in various urban centers in an effort to improve maternal well-being both before and directly after the birth of the infant (5,6). This report presents clinical and developmental data on a group of narcotic-exposed infants born to mothers who participated in one such health care program sponsored by New York Medical College, in New York City.

Description of the Population

As of April 1976, 41 infants were born to drug-abusing mothers participating in the Family Care Program (FCP) at New York Medical College. This group of mothers included 56 percent (23 Ss) black, 24 percent (10 Ss) Hispanic, and 20 percent (8 Ss) white women. The average daily dosage of prescribed methadone in the last trimester of pregnancy was 13.92 mg. with a maximum daily

dosage not exceeding 65 mg. All participating gravidas received regular prenatal care as well as nutritional supplements.

TABLE 1

	# Ss	%
Meconium-stained amniotic fluid	2	.04
Precipitous labor	1	.02
Breech presentation	3	.07
Premature birth ($\leq$ 37 weeks gestation)	10	.24
	Total =	.37

Table 1 presents the percentages of complications experienced during pregnancy, labor, and delivery. Less than half the women in the program had prenatal complications. Of those, delivery before 37 weeks gestation was the most frequent.

Of the 41 infants, 72 percent (29 Ss) were males and 28 percent (12 Ss) were females. The mean birth weight of the infants was 2,820 gms. Twenty-one percent of the infants were categorized as low birth weight (i.e. $\leq$ 2,500 gms.). This incidence of low birth weight is significantly lower than that previously reported in the literature on similar populations (7). All infants had 5 minute Apgar scores of 8 or above.

TABLE 2

Congenital Anomalies

	# Ss	%
Inguinal hernia	2	.04
Cleft palate	1	.02
Postminimus	1	.02
	Total	.08

Neonatal Complications (other than withdrawal)

Transient RDS with survival	2	.04
RDS with death	1	.02
Hyperbilirubinemia	1	.02
	Total	.08

Table 2 presents the incidence of neonatal birth anomalies and complications. Eight percent of all the subjects experienced some congenital malformation while another 8 percent experienced some complication at birth.

Methodology

Subjects

Thirty infants received careful pediatric and developmental assessment while in the hospital. The average length of hospitalization is 10 days (range = 5-14 days). After discharge, developmental assessment was continued at 3-month intervals. Sixteen infants were evaluated at 3 months of age and 14 infants at 6 months of age. The results of the developmental evaluation for the first 6 months will now be discussed.

Procedure

In the neonatal period, the Brazelton Scales of Neonatal Behavior were used to measure the infants' responses to a variety of stimuli (8). The Brazelton Scales consist of items which are neurological, cognitive, and motoric in nature. We limited our assessment to seven Brazelton Scales which primarily deal with the infant's ability to orient and attend to stimuli. The seven scales used were: inanimate visual response (red ball), inanimate auditory response (rattle), animate visual response (face), animate auditory response (human voice), response decrement to auditory stimulation (rattle), degree of "cuddliness" (a measure of hypertonicity), and capability of consolation. The infants were tested between feedings in the hospital nursery. They were unwrapped and their undershirts removed.

The Bayley Scales of Infant Development were used for mental and motor assessment within the first year of life (9). The Bayley items are organized according to standardized age norms and consist of social responses, e.g., social smile; cognitive responses, e.g., orienting to an object and grasping it; gross motor responses, e.g., sitting with slight support. During the administration of this exam, the infant sits on the mother's lap across a table from the examiner. Objects are offered to the infant by placing them on a table. The infant received both a mental and a motor score. In the case of children born prematurely, examination was carried out at the corrected, post-conceptual age.

Results

Table 3 presents the mean results of developmental testing within the first 6 months of life. At 3-7 days of life, our findings revealed that the infants responded equally to both animate and inanimate visual and auditory stimuli. They stilled with the presentation of the stimuli, but showed little spontaneous interest, little focussing and no following. When an auditory stimulus

(rattle) was repeated for 10 presentations with brief inter-trial intervals, infants showed little decrease in responsiveness over trials. When attention occurred, it was characterized by a shutdown of body movements, diminution of eye blinks, and respiratory changes. However, these changes tended not to occur until the eighth or ninth presentation of the stimulus, indicating that the infants required several repetitions of a stimulus before being able to orient and attend to it. In contrast, the normal newborn is capable of attending to a repeated stimulus by the second or third presentation and often shows habituation--or boredom with the stimulus--by the eighth or ninth trial (10). This difference in the narcotic-exposed infant's ability to attend to new stimuli and process information may be a preliminary indication of possible future cognitive dysfunction.

TABLE 3

MEAN SCORES ON DEVELOPMENTAL ASSESSMENT INSTRUMENTS

Brazelton Scales
N = 30 Subjects

Response Document (Auditory)	=	3.80
Inanimate Auditory Stimulus	=	2.34
Inanimate Visual Stimulus	=	2.34
Animate Visual Stimulus	=	2.24
Animate Auditory Stimulus	=	2.36
Cuddliness	=	3.41
Consolability	=	4.26

Bayley Scales

a. Three Months
N = 16 Subjects

	MDI	PDI
Standardized Norm	100	100
Narcotic-Exposed Infants	101	112

b. Six Months
N = 14 Subjects

	MDI	PDI
Standardized Norm	100	100
Narcotic-Exposed Infants	103	107

The results on the scales of cuddliness and consolability revealed that the narcotic-exposed infants were more irritable than the normal neonate. They were not consoled merely by the presence of the examiner's face or face and voice, but in order to be consoled had to be picked up, held, and rocked. When

held, the infants did not resist but did not participate either, i.e., they tended to lie passively in the arms of the examiner rather than evidencing the typical newborn response of molding to the caregiver.

At 3 months of age, the mean score on the Bayley mental scale was 101. The mean score on the motor scale was 112. At 6 months, the mean scores on both the Bayley mental and motor scales had not substantially changed, i.e., 103 = mental, 107 = motor. These results demonstrate that the narcotic-exposed infants perform adequately on both mental and motor protocols by 3 months of age and maintained this performance up to 6 months of age. This finding is in general agreement with other studies done on similar populations which also report developmental performances of narcotic-exposed infants to be in the average range (11,12,13).

Thus young infants who had been exposed predominantly to low maternal dosages of methadone during the last 3 months of gestation fail to show evidence of developmental dysfunction during infancy. Their initial irritability, coincident to narcotic withdrawal early in the neonatal period, and often still manifest when withdrawal has moderated (as evidenced by poor Brazelton results) has, for the most part, disappeared by 3 months. Their ability to orient, to attend to stimuli, and be socially responsive all appear to be normal at this age and continue into the sixth month.

Discussion

Although our data are sparse, preliminary explanations for these results can still be considered. First, it is possible that the pharmacological effects of the drug ingested by the mother do not have long-term effects but only influence the infant's behavior for the relatively short period of time it takes for his body to eliminate the drug and to recover from withdrawal. This hypothesis would imply that the drug does not cause any permanent, long-term damage--a conclusion seemingly indicated by the data. However, a second explanation may be that some central nervous system damage has taken place, but is not presently being manifested. It is well known that central nervous system insults may express themselves at a time well beyond the original period of trauma. Although no clear cognitive deficit has been evidenced by 6 months of age, it is possible that infants may still show some dysfunction later in life--at school age, for example, when stress on cognitive capabilities significantly increases. In addition, standardized clinical assessment techniques available to both physician and developmental psychologist are not, unfortunately, sensitive enough to detect subclinical damage. Therefore, if subtle neurological trauma had occurred, it is doubtful that with our present means of assessment, we would have detected it.

A third explanation involves the general lifestyle of these families and the possible effect it may have on the infants' development. The fact that an initial lag in attending and orienting seems to disappear by 3 months of age may, in fact, be a reflection of the intense interactions that occur between many of our drug-abusing parents and their infants. Although we tend to concentrate on the negative aspects of their lifestyle (and there certainly are

enough of these to consider), there are several positive aspects for the infant that may help to counterbalance an initial physiological deficit.

For example, many of these infants have contact with both mother and father far more so than the average middle class infant. It has been reported that a middle class father may spend as little as 30 seconds a day with his young infants (14). Often both parents in our drug-abusing families share the caregiving duties and often serve as relief for one another during the day. To a certain extent, this helps to stimulate the infant, put him in less frequent contact with an exhausted, irritable caregiver, and provide him with two interested adults to interact and play with rather than one. Secondly, because many of these adults do not work, their day tends to be structured around the schedule and needs of the infant, i.e., the infant becomes the main "activity." This, of course, can and probably often does lead to an over-stimulated infant, but at the same time it could be one reason why these infants are as socially responsive and attentive as they are at 3 months of age. Last, it is interesting to note that the condition of poverty--i.e., lack of funds for extra luxuries such as carpeting on the floor and/or vehicles to put the infant in (carriages, strollers, walkers), items a middle class family would consider necessities--may encourage and often necessitate increased physical contact with the caregiver. These infants seem to be held close to the parent a great deal more than the middle class counterpart. Indeed this seems to be a significant difference between lower and middle class families in general, regardless of involvement with drugs (15). Ironically, close physical contact may be the best treatment recommendation one could make for an irritable infant. Being kept close to the parent a good deal of the time, for the first 3 months of life, may be a contributing factor in counteracting the effects of drugs on the infant's initial cognitive functioning.

Whatever the explanation, examination of the data at hand leads to the conclusion that these infants are responding normally. Close followup over the next few years of their cognitive, social, and emotional development is critical in order to more fully assess the effect of drugs on the infant's development. Only then will a more complete appraisal be possible.

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Team Practice With Pregnant Addicts and Addicted Mothers

David Hutson, M.S.W.

This presentation was based upon a paper of similar title by Richard Brotman, Ph.D., and David Hutson, M.S.W.

How comprehensive are we in caring for the pregnant addict and addicted mother? How do we implement a comprehensive response to the patient's lifestyle? What are the training and educational implications of our Pregnant Addicts-Addicted Mothers Program (PAAM) of the New York Medical College?

Comprehensive service directly promotes positive treatment outcomes. This is not just a matter of observation and gut reaction. The data presented regarding the status of mother and infant at the time of delivery point very strongly in that direction. The instruction in child development and the potential of teaching parenting skills to adults indicate that comprehensive services can have a positive effect far beyond the delivery of a healthy neonate.

In fact, whenever you can muster these services, they make a difference compared to when they do not exist. But one question that is of vital importance is, "How can these services best be organized?"

Given the growing public interest in comprehensive health services, health professionals throughout the country must give particular attention to how those comprehensive services can be organized and delivered. We have taken the position in our program that teams--organizing people across disciplines--enhance the impact that these comprehensive services have. The chief advantage is that where you have a number of services and a number of professions together, teams make it possible to have an integrated and continuous response rather than simply a broad response.

An integrated response involves asking various types of caregivers to make decisions face-to-face, operating under common policies. This is particularly important when you are working with an at-risk population. You must quickly decide not only what the problems are, but the moves you are going to make, who is going to make them, and what the timing of the intervention is going to be. Whenever caregivers are organized by teams across the board, a more disciplined action is possible.

Continuous care seems to result mainly from the fact that you have a number of people informed about the same family and their situation who are able to support each other. Such a backup concept means that when someone is not available, or leaves the organization, you have a staff familiar with the situation who can step in and carry out the appropriate actions as you planned them.

Most of this is widely accepted and not many people would have any argument with this type of approach. At the same time, we think it is important to say that it is not automatic. If you bring a group of professionals together from different backgrounds, they will not automatically arrive at a plan they will all agree on and participate in implementing.

There are a number of things that can go wrong. For example, the issue of language is significant. Whenever professionals get together, you will hear a variety of languages. Too much jargon from too many directions can cut deeply into the efficiency of a team. As a result, you can spend a lot of time trying to resolve some rather basic issues.

We think the second thing that can happen with a team that is not well-organized, well-directed, and well-trained is that responsibility can be left up in the air. When responsibility is given to a group, the result often is that nothing gets done. It is crucial that, as you organize in teams, a mechanism is established for making sure that the responsibility for case care is documented clearly and specifically.

Another potential pitfall with the team setup is that it can encourage people to remain too specialized. In other words, because a team has several people from different professions, there is always the danger that the physician will say that we have a counselor to handle *this* kind of problem and the counselor will say that we have a physician to handle *that* kind of problem, and little connection between the problem or the people involved is ever made. So, when we organize service by teams, it does not necessarily mean the resulting process will be an effective one.

Therefore, planning, organizing, and training of the team must be done in a very conscious and thoughtful way. The question becomes what can be done to promote the effectiveness of these teams to keep them headed in the direction of an integrated and continuous response. We would like to examine that question in regard to a) the orientation of the team, b) the procedures the team employs, and c) the selection of team members.

By orientation, we are not talking about briefing or some general directive. We are really talking about those common, explicit strategies of care that it is important to establish in advance. Let us cite some examples.

First of all, we take the position that all problems and all people in a given case are to be included. Although it is tempting to believe that, because you have a variety of professionals, they will naturally get at the problem, that is not necessarily the case. There are always problems that arise which do not readily match any of the team members' specialties. Yet, it is important to include these problems.

Also, it has been demonstrated that caregivers, professionals in particular, tend to see the problems that people present in personal terms, whereas the people who present the problems see them as stemming from circumstances outside their immediate self or family, emanating instead from the large institutions that they have to deal with. It is important not only to invite and listen to all problems, but not to move too quickly to redefine those problems.

We conducted a study a year ago which correlated the extent to which we were able to address problems as presented by the family with the duration of treatment and the amount of participation. These results were rather impressive: whenever we were able to respond to and address only one presenting problem, only 24 percent of those families participated in the program for its entire duration; however, when we were able to respond to three or more presenting problems, 50 percent of the people stayed in the program for the duration. This seems to indicate that whenever you are willing to address patients' problems, they are more likely to remain in treatment. By "address" we mean take some very concrete actions in response to the problems as presented by patients rather than just listen to them.

Another point of our care strategy is that team members cannot use prognosis as a criterion in accepting new cases for care. For example, we are very enthusiastic about the results that we are getting in our parenting work. At the same time we must be careful not to begin to admit people to the program simply on the basis of their parenting potential.

Third, it seems important to maintain an extended view of the case. In caring for the addicted mother and her family, it is natural to focus on labor and delivery as the main event. Obviously it is important to provide thorough and expert care during the prenatal period and labor and delivery, but it is also important that this does not become the sole event. It can become a way of avoiding everything that has happened before and everything that it going to come after. Therefore, it is very important to maintain an approach that keeps an extended view, no matter at what point you are in the care process.

Another principle that we try to employ is that the team is responsible for patients' participation. This means that patients are really more like members than customers and the team has the responsibility for making sure that the patients come in and participate. This often means that the program must take the service to the patient.

When we first developed these teams, the first one was trained by us for a period of 2 months. The first item that we raised was the question of patient motivation. We established that so far as our work was concerned, the question would never be addressed. We received an awful lot of negative reactions from our staff because many of them came from the Department of Psychiatry. We got much the same reactions from our pediatric, internal medicine, and ob-gyn colleagues. So, each time we would meet, we would ask if there were any questions about motivation, until people were so conditioned that the answer was automatically "no."

We think that the question of whether the patient is motivated is the issue of "Do I really like her, do I really want her here?" This leads to our major point about inclusiveness, defining in rather than defining out. Nowhere in our inquiry, nowhere in our review process, do we ever discuss the question of motivation. That is largely a way of controlling the social class of one's patient population. We are not interested in it.

The basic policy we have established is that it is the responsibility of the provider to see to it that the patient gets better, not the patient's responsibility. When a printout on the patient comes at the end of the month--did the patient get better, stay the same, get worse--that responsibility is listed under the caseworker's name.

There is, as part of this, a very touchy and difficult problem that one has to address. I am talking about the use of research facts. When the researcher reports to you and says the patients are not getting better, or are remaining the same, or are getting worse, to what use does an administrator put those facts? If the doctor or the primary caseworker says, "That may all very well be true, but it is the best I can do," something must be done. You cannot just report it to the team and then think about it for another month.

The beauty of having the computer is that you don't have to do followup studies 2 years hence to find out how badly you did 2 years before. The computer tells you the next day. You can no longer wait to write a book about it. In this type of program, this can be a very difficult managerial problem.

The second area which is instrumental in keeping the teams on course is the business of procedures and established practices: the way a team is organized to carry out the strategies of care.

The first is the business of a standardized inquiry. This comes about when a family first comes to us and decides that they want to enter the program. We use an extended interview, lasting about an hour. In terms of its importance for the training of the team, it makes it possible for them to get information on all the problems of all the people involved in the case. The interview is not left up to the individual's training or style. Certain information is demanded and, therefore, the interview is more likely to be inclusive.

Furthermore, the interview helps to address the problem of developing a common language. It provides certain baseline information, a certain way of looking at things. In our program we look at eight lifestyle areas, and how people are functioning in those areas. This provides a common beginning for everyone. It is not only important to the communications within the team, but it is also one of the primary mechanisms that allows nonprofessionals to get information from the beginning in a meaningful way.

The second procedure we would like to discuss is the case review process. Here we are talking about a process that pretty much guides the management of cases for the team. The review is structured so that you ask for the information from the eight lifestyle areas as it has been collected in the referral and the in-depth interviews. You then move to identify those areas of an individual's

or a family's life that show signs of impaired functioning and ask the questions, "What is the level of risk?", "What can we hope to achieve?", "What actions should we take?", and "Who is going to carry the plan out?"

A very important function of the case review is that it helps to insure that you have covered all the bases and have planned a response for every problem and have identified who will do the work. We referred earlier to the business of being specialists and being generalists. This procedure helps to lay out a clear plan as to when, for example, the physician is also going to do the marital counseling or when the social worker is also going to do the health counseling and thus carry broader functions of care delivery to the family. This allows for supervision to be done in the light of the data generated by the case review process.

The final procedural element we would like to refer to is the routine monitoring report and the role that the evaluation person plays on a team. We attempt to have one member of the evaluation staff on each team so they can keep team members informed as to what types of patients are entering the program, what kinds of problems they have, and so forth.

As you take this information in aggregate form, you get a picture of the team's overall activity. You get an idea of what kind of problems the team is most anxious to respond to. Getting this picture on a regular basis is very important to the development of a willingness to examine what you are doing and to say ahead of time what it is you are going to do.

We also believe that this regular monitoring input in a team meeting helps to balance some of the expectations that might be misplaced. For example, our staff expected drug use to be much less of a problem at our 97th Street offices, which has a middle class patient load, than at 106th Street which is lower class. However, it turns out that the variety of drugs used is almost as great among patients at the 97th Street Center. It is going to be interesting to see after a period of 2 to 3 months how this holds up. But right now everybody has been astounded at the number of drugs used by so-called nonaddicted families.

Routine monitoring helps to clarify nonclinical issues as well. We have seen, for example, that the rate of unkept appointments is almost the same with the nonaddicted patients as the addicted ones. So, having the evaluator as part of the team helps you to keep a better perspective on these kinds of things.

The other area on which we want to comment is the selection of staff: who are the kinds of people that can live under this sort of approach--who can do well and, in fact, foster the program and make it go.

We have four general types of professionals and a nonprofessional group involved: the medical people; persons interested in child development; a counseling group largely composed of social workers; the evaluation staff; and nonprofessional counselors.

When it comes to team leaders, we have a child development worker, a physician, a nonprofessional counselor, and an M.S.W. In other words, we have used every-

one except an evaluation person. Who is the better team leader does not seem to depend on profession. It seems to depend on things like a willingness to demonstrate for others what one does well.

The other side of the same coin is how willing you are to broaden your function and become more general. You have to have someone who is willing to stand in for other team members and do other things within reason. If team members are not flexible in that regard, it antagonizes other members of the team. As a final note on the flexibility issue, is it strictly a matter of personality or is it the result of prior training? It has been suggested that it is the latter. We are not so sure, but it is reasonable to say that prior training may give you some indication of the extent to which a person is able to participate in this kind of team approach.

Monitoring & Evaluating Comprehensive Care of Addicted Families

Frederic Suffet, M.A.

Program accountability is a term which has gained wide currency in the last few years and has a multiplicity of meanings, so it would be well to be quite specific about what we mean by it at the Center for Comprehensive Health Practice of the New York Medical College. For us, accountability involves two key elements--monitoring and evaluation. Monitoring, in our scheme of things, is the routine production of data regarding program operations. It is, to put it another way, the production of program feedback in "real time," so that it may be used for administrative purposes. Evaluation, on the other hand, refers to the long-term assessment of program results. It seeks to answer the question: What outcomes may be observed for what kinds of patients under what conditions?

The implementation of the principle of program accountability is not, in any of our programs, an overnight process. It is not accomplished, say, by having the research unit design data collection forms from afar and then enforce their use by fiat. Rather, in a given program, the process involves a close and sometimes lengthy collaboration between the researchers and the action staff so that data collection procedures are workable, meeting not only the requirements of program accountability, but also yielding information which the action staff find useful in their day-to-day work. I must add at this point that while in our older programs the monitoring and evaluation procedures are fairly well set, in the Family Care Program they are still in the process of development. Nonetheless, I will describe the work that has been done to date, as well as what we are aiming toward.

As you have heard, the Family Care Program seeks to provide comprehensive medical, social, and child development services to a group of 100 families, each of which includes an addicted woman, and to another group of 100 families in which addiction is not part of the picture. It is a program of many interrelated parts, involving staff from a variety of disciplines, serving not just individual patients, but families of diverse background and composition. A system of accountability for such a program must aim to be as comprehensive as the program itself, and thus must attend to many things simultaneously.

The heart of the system is a set of instruments which obtain data at a number of key points in the treatment process. These instruments perform several important functions. First, they codify a way of work. They define what we consider important to look at in a given case, and in this way they provide a

common frame of action for a multidisciplinary staff. This is not an unimportant consideration, for a program which employs staff of such varied backgrounds requires some mechanisms to integrate their work and to permit them to take concerted action within a common perspective. Second, the instruments serve as case records. They describe each family, including the members' strengths and problems, and they document our treatment plans and goals and the ongoing work done in each case. Third, the instruments provide the data needed for monitoring and evaluation.

To date, we have designed four basic instruments. The first is a one-page referral form which is filled out when a case initially comes to our attention. It obtains demographic data and some information on the family's immediate needs and problems.

The second form is a screening interview questionnaire. It is a 26-page instrument which records information concerning the family members' recent and current situation in a series of eight life-functioning areas. These are: family relationships, health, substance use, housing, legal involvements, education, employment and finances, and use of leisure time.

Once a screening is completed, the worker who conducted it presents a summary of the information to one of the program's treatment teams. At this time the third instrument, called the status form, comes into use. It is a one-page, mostly precoded form, which documents the treatment plans in a given case as these are formulated by the team. It shows, for each family member, which life-functioning areas are targets for intervention, and it also shows which of the program's various service components the team designates as appropriate.

The fourth instrument is called the contact form. It is used to record the details of each interaction--a counseling session, for example--between patients and staff.

A fifth instrument is now being designed. Called the monthly activity summary, it will also be a precoded form which will, for one-month periods, summarize the extent to which each family member participates in the program's different service units.

Finally, in the future we intend to design a followup questionnaire. This would be administered some time after a family had enrolled in the program--possibly a year--and it would obtain information on whatever changes had occurred in each of the life-functioning areas listed above.

How would these instruments be used for purposes of program accountability? With respect to monitoring, they have several uses. For instance, we can do straightforward things like generate up-to-date demographic profiles of our patients. Thus, we see that of 66 addicted women admitted to the program in 1975, most are from minority groups (55% black and 28% Hispanic), most are young (68% under age 25), only 33 percent had completed high school, 50 percent had a legal or common law spouse, and 42 percent were spending an average of $50 or more per day on illicit drugs before they entered the program and so on. This is the kind of information we are often asked to supply to the funding and administrative agencies which oversee our programs.

Beyond this, we can, as needed, generate from the status form a census of the entire active caseload showing the distribution of intervention targets and service units. And we plan, in the near future, to produce a monthly computer printout based on the activity summary. This printout would show, for each case individually and for certain aggregates of cases (such as all those assigned to a given treatment team), the degree of participation in the program's service units. We have already developed something similar for one of the Center's other drug treatment programs, and it has proved very useful, both for administrative purposes internally and for generating the monthly statistical report required by the city agency which oversees the program.

In regard to long-term evaluation, all of the data obtained by all of the forms could, in principle, be utilized. The general strategy is to ask whether outcomes vary according to three main sets of variables: first, the types of people who enter the program (described demographically); second, their condition at entry into the program (as shown by the screening data); and third, by type and degree of intervention (as measured by the status form and monthly activity summary). Given the discrete variables within each set, and the many combinations of variables within and across sets, the procedure would be to divide the treatment population into subgroups (according to some formal hypothesis, or, more likely, just plain hunch), and then see how outcomes vary between them. The intent is not only to discover what the program has accomplished, but also to raise policy issues. To take but one example of this, let us conclude by discussing a well-known phenomenon: the mother's escalation of drug use, in this case legal methadone, after the birth of the baby.

Through the beginning of February, 37 of our addict patients had given birth. All but six were receiving methadone just prior to delivery, none more than 40 mg., with the majority receiving 5 to 20 mg. Within 2 months of the delivery, 19 of the mothers showed a dosage escalation, usually between 5 and 20 mg., over their predelivery level. To what, if anything, is this related?

Because the number of cases is small, we can only introduce one independent variable at a time. Thus, the findings should be regarded as tentative and suggestive, not definitive.

When we look, first, at educational level, we see that 38 percent (6/16) of the patients who were graduated from high school showed an escalation, compared to 65 percent (13/20) who are not high school graduates. Next, of those who live with a spouse (either legal or common law), only 28 percent (5/18) increased their methadone intake, compared to 74 percent (14/19) who do not reside with a spouse. In regard to illicit drug use, 54 percent (7/13) of those who were not using heroin when they entered the program showed a dosage escalation, in contrast to 86 percent (12/14) who were using heroin at the time of entry.

Thus, it would seem that those women who might be characterized as more conventional, more integrated into the social mainstream, are less likely than those who are not quite as conventional to go on to a higher postdelivery methadone dosage. This perhaps implies that the more conventional are better able to

cope with the difficulties of the early stages of motherhood, while the others, possibly lacking certain social supports, need a chemical "support" to assist them. If this is what the findings truly indicate, then those who counsel addict mothers of newborns should be alert to their special needs, to the strains they possibly experience in performing a role or task for which they perhaps have not been adequately socialized. Viewed in this way, a methadone escalation serves as a coping device. This is a potential policy issue which deserves more attention.

Investigating Treatment Outcomes: A Who-Done-It Model

Irving Silverman, Ph.D.

Introduction

If you see yourself as a hard-nosed scientist, then you may wish to look at the evaluation of a drug treatment program as a kind of detective story. First of all, you require a corpus delicti. You know that an alleged program may not be real. A real program has intentions that can be defined; it has patients who are treated and who can be followed after treatment to find out how they are doing in relation to what was intended for them. Given that this "body of a crime" has been discovered, you are ready to ask the classic question: "Who done it?" Accepting that treatment was rendered by a program, and accepting that some good results for patients followed, one still has not established that the program did it. Maybe the patients would have fared no differently if the program had never existed.

There is, to be sure, a well-tested way to answer the who-done-it question about changes that follow treatment. That is the double-blind therapeutic trial, an established experimental model. This technique relies upon the concept of the method of difference. You measure the difference between treated and untreated groups that are otherwise equivalent. But efforts at social rehabilitation cannot be done blindly or withheld randomly. If experimentation is out, what other alternative is available? We suggest the *method of concomitant variation.* By that approach, you make comparisons within the treated group and you try to find out how things that you do and the results that you find happen to relate.

To illustrate how that method may be developed and put to use, the kind of evaluation design that we have used at the New York Medical College in past and present drug treatment programs will be described (1), and some of the data from a followup study will be reviewed (2).

An Evaluation Design

A drug treatment program that aims at comprehensiveness has the same treatment goal for all patients--to promote their overall well-being. Such a program is mandated to deal with problems related to drugs, but the payoff is general and therefore not stated in terms of drugs only.

In our program design, we take account of drug use as one of several "areas of life" that have general relevance to well-being. In making a case plan, we classify our intentions to act by a set of nine such "target areas." They are: family, offenses, vocation, substance use, associates, leisure, residence, health, and agency use.

To get information about these nine areas of the patient's life, we rely most on face-to-face interviews with him or her. At Time One, before treatment, we use a screening schedule, and at Time Two we use a followup schedule. After each interview, a case review team judges the "status of the case" on a one-page form. At Time One, the team makes an initial treatment plan by declaring our intentions. The team also assigns primary responsibility for managing the case to one specific worker who may be helped by various others. The case plan is flexible; it may be revised ad hoc whenever anything changes materially in the conduct of the case.

In an ideal world, we would do routine followups of all patients after standard intervals. However, the amount of persistence needed to get many of these interviews means that the interval between Time One and Time Two falls out of control, and the whole enterprise is so expensive that it must be done as a special study rather than routinely. While we were trying out various approaches, we used the first 100 cases that we were able to follow up to do a pilot study. Its sampling is clearly biased, but it allows us a look at an extensive range of information.

In the followup interview, we ask the patient to rate his overall well-being now as "Better or Same or Worse" than at the time we first saw him. Of the 100 patients, 35 said Better, 52 Same, and 13 Worse. This item is our simplest available measure of outcome. Also the review team does a rating at Time Two of each intention that was declared at Time One. The rating categories are A for Attained, C for Continued, or B for Bypassed. (B means that neither A nor C applies, that for one reason or another we dropped the intention.)

Suppose, for example, that at Time One we declared Family as a target area in half of the 100 cases. At Time Two these 50 cases fall into three groups according to whether the Family intention was realized or not. At best it was Attained, or else it was Continued, or at worst it was Bypassed. For each of these three groups we note the proportion of the total who said that their global well-being was Better at Time Two than at Time One. With this information we can graph an outcome variable as a function of a disposition variable for each of our nine target areas. The numerical data appear in chart 1 and the graphs are shown in chart 2. Let us review and interpret these findings.

For four of the target areas, the relation between outcome and disposition is direct. The "percent Better" is low if we bypass the target; it is higher if we continue the target; and it is highest if we attain the target. The four areas that show this direct curve are: Family, Offenses, Vocation, and Substance Use. Family and Vocation are areas for enhancing conventionality. Offenses and Substance Use are areas for reducing deviance. We interpret these four curves as examples of "salvation by good works." If you can manage to gain the things that are conventionally defined as good, it will tend to improve your well-being.

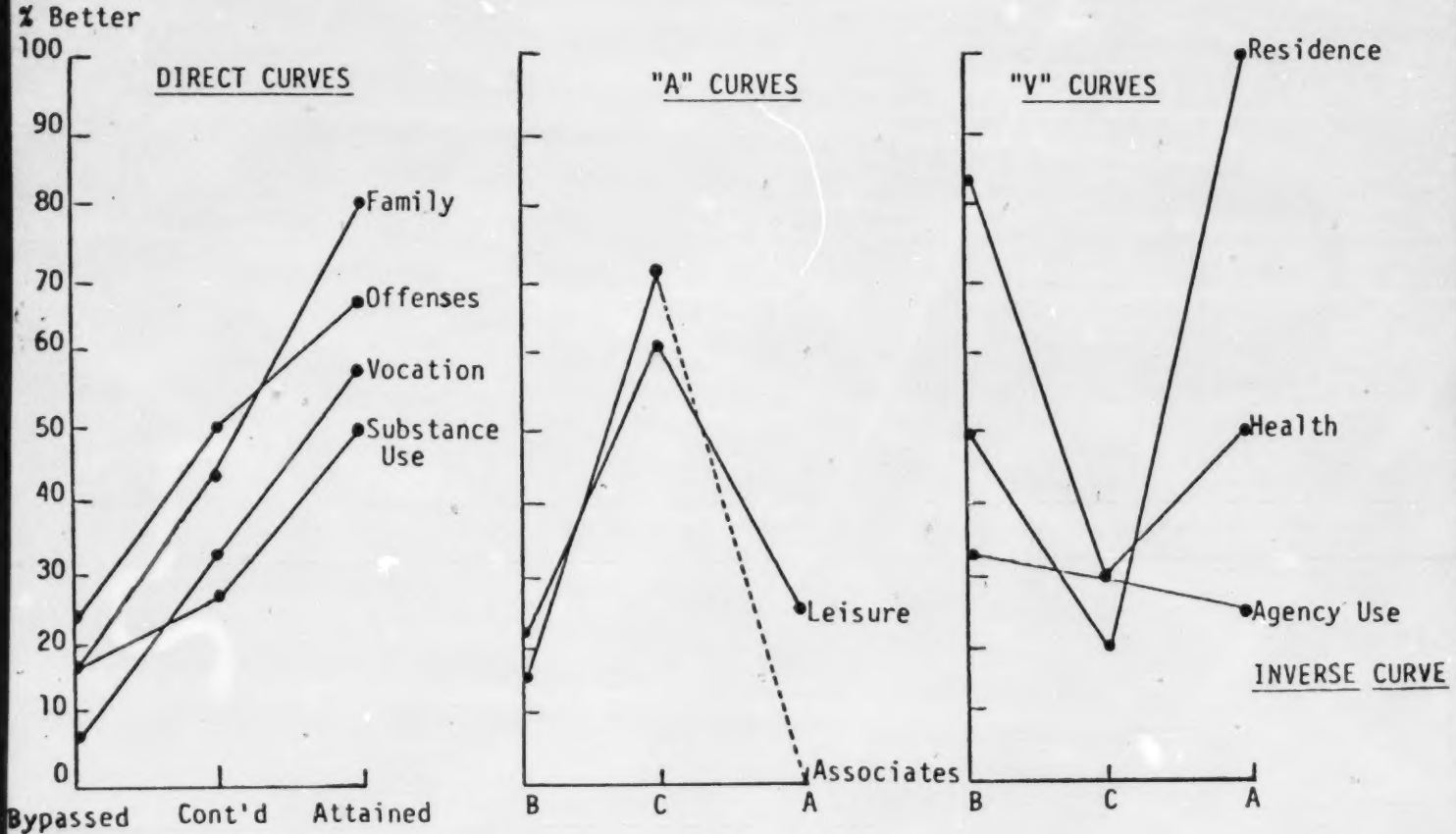
CHART 1

PERCENTAGE OF PATIENTS WHO ARE GLOBALLY "BETTER" BY THE STATUS OF AN INTENTION TO TARGET IN EACH OF NINE AREAS

Target Areas	Time I: Declared		Time II Statuses (If Declared)					
	% (Better)	N (=100%)	Bypassed		Continued		Attained	
			%	N	%	N	%	N
1. Family	40	(52)	17	(12)	43	(35)	80	(5)
2. Offenses	44	(9)	25	(4)	50	(2)	67	(3)
3. Vocation	27	(48)	6	(17)	33	(24)	57	(7)
4. Substance Use	28	(58)	17	(12)	26	(38)	50	(8)
5. Associates	35	(20)	15	(13)	71	(7)	--	-
6. Leisure	29	(28)	21	(19)	60	(5)	25	(4)
7. Residence	35	(31)	50	(8)	20	(20)	100	(3)
8. Health	34	(87)	83	(6)	30	(77)	50	(4)
9. Agency Use	30	(61)	33	(3)	30	(50)	25	(8)

CHART 2

Graphs of Chart-1 Areas: Percent Better by Status Categories



Two of the target areas show A curves. The percent Better is high if we continue the strategy, otherwise it is low. The two areas are Leisure and Associates. These are the areas where the individual is supposed to find benefit in completely voluntary involvements. We interpret these two A curves as examples of "salvation by love." The strategy tends to work if you can get it going, but only for so long as you keep it going. We see this pattern in residential treatment programs, where those who stay are benefited by involvement while it continues. Such programs tend to lose their failures early and to keep their successes for a long time.

Two of the target areas show V curves. The percent Better is low if we continue the strategy, otherwise it is high. The two areas are Residence and Health. In these two areas the patient must try to get what he needs from established agencies, and they have established ideas about whom they choose to serve. The "elect" get service and the "damned" do without. If you look like an addict, you are "predestined" to a hard time. If our worker is trying to help you get an apartment or an examination, and he can neither bypass nor attain this strategy, then you probably do not look good from the other side of a desk. We interpret the V curves as examples of "salvation by predestination." The remedy in these areas lies in an "advocacy," or "community development" effort. You work on community agencies to be more receptive to addicts and more confident about their ability to deal with them.

The target area of Agency Use shows a curve that is nearly flat but slightly inverse. Our efforts to "pass the ball" to other agencies are nonproductive or counter-productive. However, one of our procedures is to bring in other agencies by joining with them in case reviews and other efforts. (That intention is not graphed here because we classed it as a method rather than a target.) These agency joinings show a very high percent Better if we attain or continue them and zero percent Better when they fall through.

Discussion

The information that we have presented makes it difficult to believe that what happened during treatment made no difference for the condition of the patients after treatment. Admittedly, the relations we found are complex and our interpretations of them are speculative. We did not furnish unassailable proof on the who-done-it question. However, when you are treating people with drug problems, you are practicing healing arts and you cannot expect perfectly correlative results. What you can expect is feedback by which to relate your efforts to what follows after them in order to get ideas on how to improve what you do. That is what our approach to evaluation attempts to do.

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